361
S7f
80
DEC 10 1952

LIBRARY
FISH & WILDLIFE SERVICE
PACIFIC OCEANIC FISHERY
INVESTIGATIONS

PILCHARD EGGS AND LARVAE AND OTHER FISH LARVAE, PACIFIC COAST - 1950

SPECIAL SCIENTIFIC REPORT: FISHERIES No. 80

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

The series embodies results of investigations, usually of restricted scope, intended to aid or direct management or utilization practices and as guides for administrative or legislative action. It is issued in limited quantities for the official use of Federal, State or cooperating agencies and in processed form for economy and to avoid delay in publication.

Washington, D. C.
October, 1952

PILCHARD EGGS AND LARVAE AND OTHER FISH LARVAE, PACIFIC COAST, 1950

By Elbert H. Ahlstrom

This report contains records of the quantitative sampling of fish eggs and larvae off the west coast of North America during 1950. The area included is roughly that lying between the Columbia River and Punto Abreojos, Lower California, and extending 350 to 400 miles off shore. The species included are the pilchard or sardine (Sardinops caerulea), northern anchovy (Engraulis mordax), jack mackerel (Trachurus symmetricus), hake (Merluccius productus), and rockfish (Sebastodes spp.). 1/

In the tables, pilchard larvae are enumerated by size categories, and pilchard eggs by age (in days) since spawning. Northern anchovy larvae are also enumerated by size categories. Tabulations are given of the numbers of jack mackerel, hake, and rockfish, three of the most abundant species in the collections. In addition, haul data are given for all collections taken during cruises 11 through 18, February through September, 1950. Descriptions of the eggs and larvae of the jack mackerel and hake are being prepared for early publication.

The purpose of this report is to put these data on record. Analyses of the data will be presented in subsequent publications.

The investigation of the distribution and abundance of pilchard eggs and larvae is one of the major lines of research being pursued by the South Pacific Fishery Investigations of the U. S. Fish and Wildlife Service under the California Cooperative Sardine Research Program. This program is sponsored by the Marine Research Committee and is being carried out in conjunction with the Scripps Institution of Oceanography of the University of California, the California Department of Fish and Game, the California Academy of Sciences, and the Hopkins Marine Station of Stanford University.

It is a pleasure to acknowledge the wholehearted cooperation of the Scripps Institution of Oceanography, both in the collection of data at sea and in its processing ashore. The whole staff of the South Pacific Fishery Investigations of the Fish and Wildlife Service contributed to this investigation, with the majority of the workers devoting their full time to it. When it is pointed out that about 50 persons participated in each cruise, either in the collection of material or in the operation of the vessels, and that nearly half this number of persons worked with the material ashore, it will be evident why it is impracticable to include individual acknowledgments.

1/ The collections were designed primarily to yield information on pilchard. Information on the other species is partially an incidental, although not unexpected byproduct.

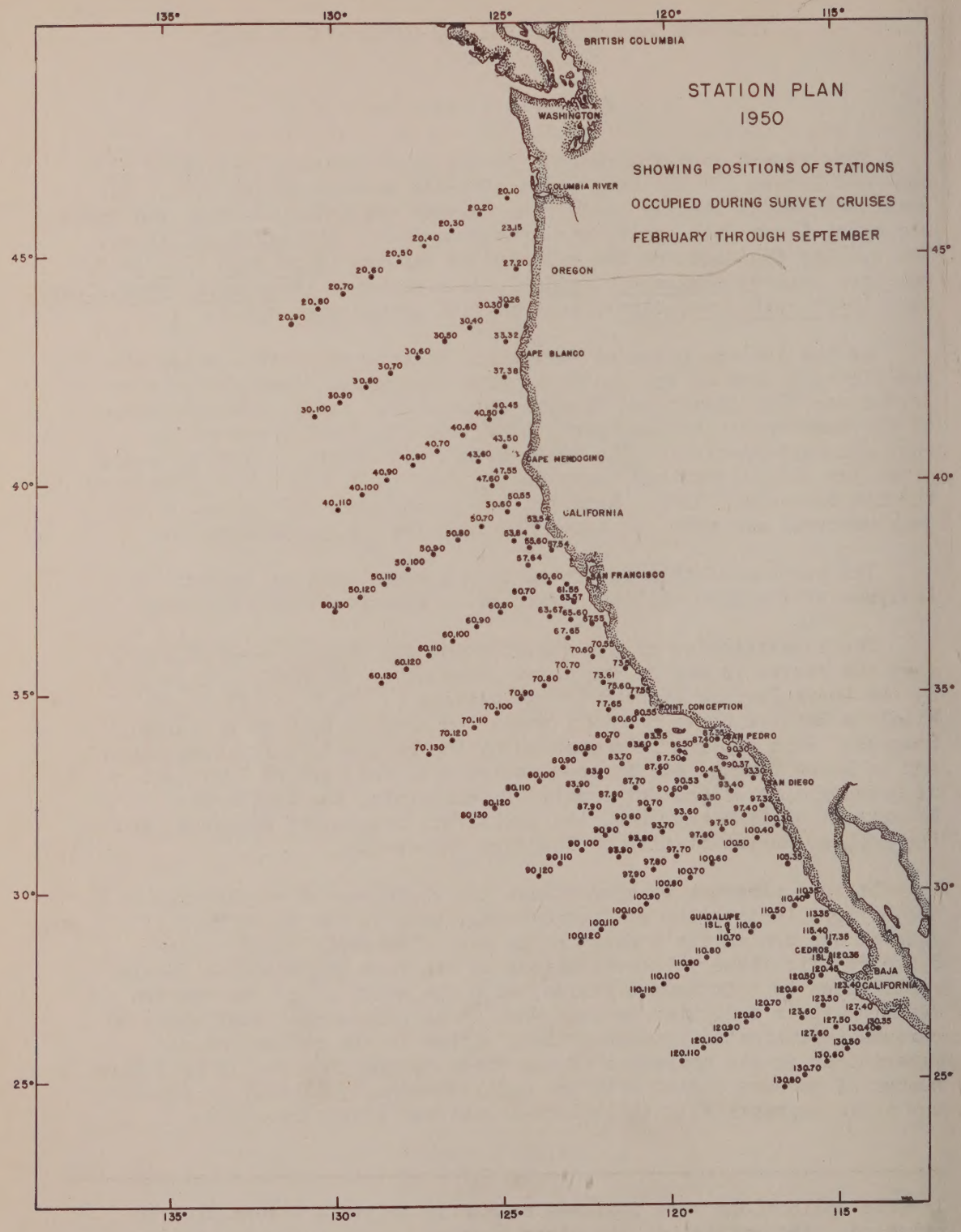

Figure 1. Station plan, showing location of all stations occupied during the 1950 survey of the distribution and abundance of pilchard eggs and larvae.

AREA COVERED

The area covered during the survey is shown in figure 1. Not all of the 167 stations shown were occupied monthly; as can be seen from the following tabulation, only 93 to 140 stations were occupied on a given cruise.

Text table 1. Stations scheduled and occupied on cruises 11 through 18.

	Month	Number scheduled	Number occupied	Percent occupied
Cruise 11	February	118	114	97
Cruise 12	March	130	111	85
Cruise 13	April	130	125	96
Cruise 14	May	130	129	99
Cruise 15	June	140	106	76
Cruise 16	July	140	140	100
Cruise 17	August	93	93	100
Cruise 18	September	109	108	99
Total		990	926	

The number of stations scheduled for each cruise is shown in text table 1. A simplified tabulation giving the station lines scheduled for each cruise and the vessel assigned to work each line is given in text table 2. Most stations were occupied six to eight times during the season, but stations on the northernmost line were occupied only once (cruise 17) and on the next adjacent line only twice (cruises 17 and 18).

Three vessels participated in each of the monthly cruises. The Crest, operated by the Scripps Institution of Oceanography, and the Black Douglas, operated by the U. S. Fish and Wildlife Service, took part in all of the eight cruises, while the third participating vessel was either the Horizon or the Paolina T., operated by Scripps. Three of the vessels successfully occupied 97 percent or more of the stations assigned to them.

METHODS OF SAMPLING

Fish eggs and larvae were collected by plankton nets that measure 1.0 meter in diameter at the mouth by about 5 meters in over-all length. The nets were constructed of No. 30xxx grit gauze, a rugged grade of Swiss silk bolting cloth. A sketch of the type of net employed has been given in a previous report (Ahlstrom 1948, fig. 4).

The plankton hauls were taken obliquely from about 70 meters deep to the surface at a vessel speed of about 1-1/2 to 2 knots. In taking a haul, the net was lowered on 100 meters of wire (1/4-inch cable) at the rate of about 50 meters a minute, then retrieved at the rate of 5 meters a minute. The actual depth reached by the net varied somewhat from haul to haul, depending upon the speed of the ship and the state of the sea. As most of the vessels used for taking plankton hauls could not be slowed down sufficiently when the sea was fairly calm, it was necessary to start and stop the engine frequently during a haul in order to approximate the desired towing speed.

A film trace of the actual path of the net during hauls has been obtained for the tows made on at least one vessel per cruise, by using a microplankton sampler in conjunction with the regular net. The microplankton sampler is fastened about 2 to 4 meters below the regular plankton net. The sampler is equipped with a calibrated bellows and a rotator. A continuous record of the depth of the sampler in the water and the amount of water strained by it during a haul is obtained as a stylus scratch on clear 35-mm. acetate film, the amount of water strained, being recorded on the horizontal axis, the depth of the net on the vertical. From these traces we have verified that the depth of the net at any instant during a haul can be approximated by multiplying the amount of wire cut by the cosine of the angle of stray of the towing wire from the vertical (see fig. 2).

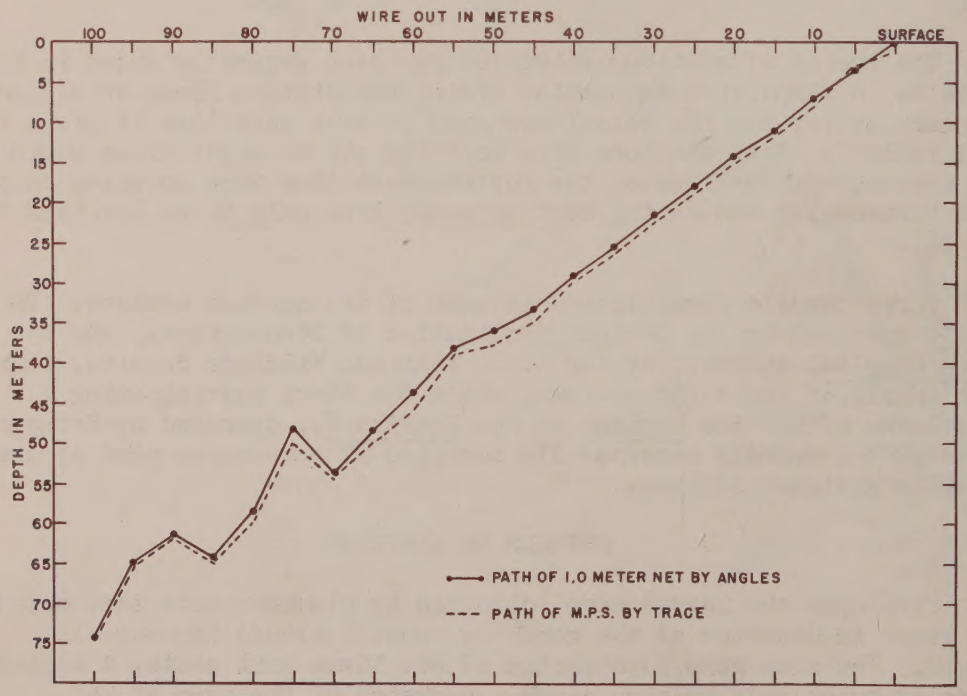

Figure 2. Comparison of the path of a 1.0 -meter plankton net during an oblique haul upward (as determined from the cosine of the angles of stray of the towing wire) with the path of a microplankton sampler (M.P.S.) attached 2.5 meters below the 1.0-meter net, as determined from a film trace made by a pressure bellows.

Text table 2. Station lines scheduled to be occupied on cruises 11 through 18, February-September 1950.

	Cruise							
	11	12	13	14	15	16	17	18
Line 20	-	-	-	-	-	-	B	-
Line 30	-	-	-	-	-	-	B	B
Line 40	-	B	B	B	B	B	B	B
Line 50	B	B	B	B	B	B	B	B
Line 60	B	B	B	B	B	B	C	B
Line 70	C	B	B	B	B	B	C	B
Line 80	B	C	H	H	C	C	C	-
Line 83	C	C	H	H	C	C	P	-
Line 87	C	C	H	H	C	C	P	-
Line 90	C	C	H	H	C	C	C	C
Line 93	C	C	H	H	C	C	-	-
Line 97	C	C	H	H	C	C	-	-
Line 100	H	H	C	C	P	P	-	P
Line 110	H	H	C	C	P	P	-	P
Line 120	H	H	C	C	P	P	-	P
Line 123	H	H	C	C	P	P	-	P
Line 127	H	H	C	C	P	P	-	P
Line 130	H	H	C	C	P	P	-	P

Throughout the report, vessels used on survey cruises are designated by the following letters: B - Black Douglas; C - Crest; H - Horizon; P - Paolina T.

MEASUREMENT OF VOLUME OF WATER STRAINED DURING PLANKTON HAULS

A measure of the volume of water strained during a haul was derived from current meter readings. An Atlas-type current meter was fastened in the center of the mouth of each net. Seven current meters were used during cruises 11 through 18. Two were lost at sea during this period, current meter No. 6 on cruise 12, and current meter No. 5 on cruise 13.

The current meters were calibrated before and after each cruise on which they were used. In calibrating, the current meters were towed over a measured distance at different speeds. Performance graphs were constructed in which the length of the column of water strained per revolution of the current meters (meters/rev) was plotted as the dependent variable against the rate of towing (revolutions per second). Since these performance tests were made both before and after each cruise, the graphs applicable to a given cruise were a combination of two calibration trials.

A table is given of the performance of the current meters at two selected speeds (text table 3). Some of the current meters were quite consistent in their performance over a long period of use. In this category were current meters Nos. 5, 6, and 31. Other meters changed their performance gradually, becoming less free-running with continued use (current meter No. 81). The abrupt change in performance of current meter No. 32 on Horizon cruise 14 was due to an accidental change in the pitch of the blades of the current meter's impeller.

For any given haul, the appropriate calibration graph was used to determine the performance of the current meter (length of the column of water strained per revolution) at the speed at which the haul was taken (average rev/sec). The volume of water strained during a haul was determined by multiplying the number of revolutions registered by the current meter during a haul by this value, and then taking the cross-sectional area of the mouth of the net (in square meters) into account.

For the very few hauls lacking reliable current meter readings, an approximate value was obtained which represented the average performance of the current meter at the rate of speed at which the particular hauls were made. Such values in table I are enclosed by parentheses.

STANDARDIZATION OF THE HAULS

For comparability with past data, the same method of standardizing hauls has been employed as that described in a previous report (Ahlstrom 1948). This standard adjusts the number of eggs or larvae in a haul to the number in 10 cubic meters of water strained per meter of depth fished by the net. If the vertical distribution of the eggs or larvae has been encompassed, this value is equivalent to the number under 10 square meters of sea surface. The reader is referred to the above-cited paper for details.

SEPARATION OF FISH EGGS AND LARVAE FROM PLANKTON SAMPLES

Fish eggs and larvae were separated from the other constituents of the plankton hauls by examining the material under a low-power microscope. For the majority of hauls (647 samples, representing about 70 percent of the hauls) the complete samples were examined. Owing to the large volume of plankton taken in some hauls, it was necessary to fraction these into aliquot portions. A few samples were divided into as many as 16 aliquots (6.25 percent each), but most fractioned samples were divided into 2, 4, or 8 aliquot portions. For all aliquots smaller than 50 percent, two portions of each sample were sorted. A tabulation follows of the number of samples from each cruise that were fractioned and the percent of each that was sorted.

Text table 3. Current meter performance data for two selected speeds (cruises 11 through 18).

(Based on the average of two calibrations, one made before, the other after the cruise indicated.)

Current meter	Cruise on which used	Meters/rev at - - 2.0 rev/sec 1/	Meters/rev at - - 3.5 rev/sec 1/
No. 5	B-11	0.252	0.243
	B-12	0.253	0.239
	Lost at sea on cruise 13		
No. 6	C-11	0.250	0.250
	Lost at sea on cruise 12		
No. 31	P-11	0.233	0.218
	C-13	0.234	0.220
	C-14	0.239	0.229
	C-15	0.246	0.232
	C-16	0.243	0.232
	C-17	0.231	0.225
No. 32	H-11	0.261	0.250
	H-12	0.258	0.245
	H-13	0.256	0.245
	H-14	0.253/0.287	0.242/0.273
	P-15	0.295	0.281
	P-16	0.302	0.290
	P-17	0.302	0.298
No. 81	B-14	0.258	0.252
	B-15	0.270	0.260
	B-16	0.281	0.274
	C-18	0.290	0.280
No. 82	B-17	0.276	0.270
No. 87	P-18	0.353	0.352

1/ The average rev/sec registered by the current meters during most hauls lie between these two values.

Text table 4. Number of samples from each cruise, by proportion of sample sorted

	Fractioned samples examined by sorting aliquot portions representing--			Whole samples sorted	Total samples examined
	12.5 percent of sample	25 percent of sample	50 percent of sample		
Cruise 11	3	8	15	88	114
Cruise 12	2	7	28	74	111
Cruise 13	-	17	42	66	125
Cruise 14	1	12	34	82	129
Cruise 15	-	-	20	86	106
Cruise 16	-	4	41	95	140
Cruise 17	1	2	18	72	93
Cruise 18	-	2	22	84	108
Total	7	52	220	647	926

LITERATURE CITED

Ahlstrom, Elbert H.

1943. Studies on the Pacific pilchard or sardine (Sardinops caerulea) 4. Influence of temperature on the rate of development of pilchard eggs in nature. U. S. Fish and Wildlife Service, Spec. Sci. Report No. 23, 26 pp.

1948. A record of pilchard eggs and larvae collected during surveys made in 1939 to 1941. U. S. Fish and Wildlife Service, Spec. Sci. Report No. 54, 76 pp.

Marr, John C., and Elbert H. Ahlstrom

1948. Observations on the horizontal distribution and the numbers of eggs and larvae of the northern anchovy (Engraulis mordax) off California in 1940 and 1941. U. S. Fish and Wildlife Service, Spec. Sci. Report No. 56, 13 pp.

Sette, Oscar E., and Elbert H. Ahlstrom

1948. Estimations of abundance of the eggs of the Pacific pilchard (Sardinops caerulea) off southern California during 1940 and 1941. Sears Found. Journ. Mar. Res. vol. VII, No. 3, pp. 511-542.

GUIDE TO TABLES

Table I.--Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950.

Station: The letter preceding the station number is used to designate the vessel from which the collections were made. The four participating vessels are designated as follows: B - Black Douglas; C - Crest; H - Horizon; P - Paolina T. Station numbers are made up of 4 to 6 figures separated into two groups by a dot. The figures before the dot represent the number of the line on which the station occurs, the figures following the dot represent the position of the station on the line. Station lines are numbered from north to south, stations on lines from inshore to offshore. Refer to figure 1, the station chart for 1950, showing all stations occupied during cruises 11 through 18.

Position - N. lat., W. long.: The positions given represent the best estimate of the position of occupancy of each station.

Date: Month given in Roman numerals, the day of the month in Arabic; thus VIII-5 is August 5.

Hour: The time indicated is approximately that of the mid-depth of the haul as the net was being brought obliquely upward. The hours are given on a 24-hour basis; thus 1930 is equivalent to 7:30 p.m.

Duration of Haul: Given in minutes to the nearest quarter minute.

Depth (Meters): Depth of the stratum fished, in meters.

Vol. of Water Strained: In cubic meters (see preceding text). Estimates given in parentheses were not based on current-meter readings.

S. Factor: Standardized haul factor (for explanation, refer to Ahlstrom 1948).

Table II.--Record of Pilchard Eggs, 1950.

Number of Normal Eggs: Number of normally developing pilchard eggs.

Total number of Eggs: Includes all pilchard eggs taken in a sample, whether normal or abnormal. Pilchard eggs were classified as abnormal when the embryos were stunted and misshapen in appearance. It is not known whether such abnormalities are caused by a diseased condition of the eggs or by mechanical injury during collection.

Pilchard eggs are separated into the several days of spawning represented in each sample (see Ahlstrom 1943). The age categories are designated as follows: A - eggs spawned within 24 hours of collection; B - eggs spawned within 24 to 48 hours of collection; C - eggs spawned within 48 to 72 hours of collection; D - eggs spawned within 72 to 96 hours of collection; Unclass. (Unclassified eggs) - refers to deteriorating eggs that could not be classified with certainty; n - total number of pilchard eggs in a standardized haul.

Average n': Average number of eggs in a standardized haul per day of spawning represented. Because of incomplete age categories, resulting from collection being made while spawning or hatching was actively taking place, not all age categories were used in determining n', but only those followed by an asterisk (for a discussion of this problem, refer to Sette and Ahlstrom, 1948).

Table III.--Record of Pilchard Larvae, 1950

Midpoint of size classes: The larvae are grouped into size classes which have the following midpoints and ranges:

Midpoint (in mm.)	Range (in mm.)	Midpoint (in mm.)	Range (in mm.)
3.25	2.25 - 4.25	12.75	12.26 - 13.25
		13.75	13.26 - 14.25
4.75	4.26 - 5.25	14.75	14.26 - 15.25
5.75	5.26 - 6.25	15.75	15.26 - 16.25
6.75	6.26 - 7.25		
7.75	7.26 - 8.25	17.25	16.26 - 18.25
8.75	8.26 - 9.25	19.25	18.26 - 20.25
9.75	9.26 -10.25	21.25	20.26 - 22.25
10.75	10.26 -11.25	23.75	22.26 - 25.25
11.75	11.26 -12.25		

Table IV.--Record of Anchovy Larvae, 1950

Same as above except for the first category: 3.0 mm. size class containing larvae from 1.76 to 4.25 mm. in length.

In previous paper dealing with the numbers of anchovy eggs and larvae collected off southern California during 1940 and 1941 (Marr and Ahlstrom 1948), larvae were tabulated by numbers but not by size.

Table V.--Record of the larvae of Jack Mackerel (Trachurus symmetricus), 1950

The standardized numbers of larvae are listed by station for the eight cruises, 11 through 18, and a station total given in the next to the last column. The station average (last column) represents the average number of larvae per haul taken during the season at each station. A dash indicates that the station was not occupied on the cruise.

Table VI.-- Record of the Larvae of Hake (Merluccius productus), 1950

The comments concerning Table V are applicable to Table VI.

Table VII.--Record of the larvae of Rockfish (Sebastodes spp.), 1950

Refer to the comments given above for Table V. The larvae of all species of rockfish taken in our collections are grouped together as Sebastodes spp.

Table I

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
Cruise 11								
B-50.55	39°30'	124°30'	II-16	1310	23.25	0-69	785.9	.874
50.60	39°20'	124°52'	II-16	1715	22.5	0-71	778.0	.907
50.70	39°00'	125°36.5'	II-16	2345	24.0	0-67	823.8	.816
50.80	38°40'	126°21'	II-17	0640	25.25	0-77	847.6	.907
50.90	38°20'	127°05'	II-17	1230	22.75	0-68	768.6	.883
50.100	38°00'	127°49'	II-17	1900	24.5	0-69	848.8	.808
50.110	37°40'	128°33'	II-18	0250	23.5	0-70	787.6	.886
50.120	37°20'	129°16.5'	II-18	0925	23.5	0-69	819.8	.837
50.130	37°00'	130°00'	II-18	1940	24.75	0-71	804.1	.888
55.60 *	38°28.5'	124°14'	II-16	0400	24.25	0-73	733.6	.999
60.60	37°37'	123°37'	II-15	1230	23.0	0-67	819.7	.820
60.70	37°17'	124°21'	II-15	0700	22.5	0-70	742.9	.945
60.80	36°57'	125°04'	II-15	0025	23.75	0-71	666.0	1.060
60.90	36°37'	125°47'	II-14	1815	22.5	0-71	689.7	1.028
60.100	36°17'	126°30'	II-14	1145	22.25	0-73	705.2	1.037
60.110	35°57'	127°12'	II-14	0550	23.75	0-70	782.5	.898
60.120	35°37'	127°54.5'	II-13	2310	23.75	0-68	797.0	.852
60.130*	35°17'	128°37'	II-13	1700	23.75	0-72	827.7	.875
61.55	37°37'	123°07.5'	II-15	1715	12.25	0-67	434.6	1.546
65.60	36°45'	123°00'	II-8	0850	24.25	0-68	851.1	.793
70.55	36°03'	122°02'	II-8	1755	25.75	0-75	792.0	.951
75.60	35°01'	121°46'	II-9	0240	26.75	0-78	906.4	.857
80.55	34°19'	120°48'	II-9	1250	13.25	0-66	478.3	1.388
80.60	34°09'	121°09'	II-9	1735	12.75	0-65	466.8	1.386
80.70	33°49'	121°51'	II-9	2355	14.0	0-63	535.7	1.182
80.80	33°29'	122°32'	II-10	0715	23.75	0-72	752.6	.961
80.90	33°09'	123°13'	II-10	1500	12.75	0-74	410.3	1.803
80.100	32°49'	123°54'	II-11	0915	23.25	0-70	776.9	.906
80.110	32°29'	124°34.5'	II-11	1950	14.5	0-70	556.2	1.258
80.120	32°09'	125°15.5'	II-5	0830	24.5	0-68	829.6	.821
80.130	31°49'	125°56'	II-5	0145	28.25	0-75	962.0	.780
C-70.60	35°51'	122°21'	II-2	0410	23.0	0-70	670.8	1.050
70.70	35°33'	123°06'	II-2	1155	22.5	0-70	695.3	1.013
70.80	35°12'	123°48'	II-2	1630	24.75	0-70	694.6	1.015
70.90	34°53'	124°30'	II-2	2230	22.25	0-76	606.7	1.261
70.100	34°32.5'	125°12'	II-3	0500	23.0	0-71	623.6	1.140
70.110			No sample obtained					
70.120			Not occupied					
70.130			Not occupied					
83.55	33°44'	120°24'	II-10	1105	12.0	0-66	377.5	1.754
83.60	33°33'	120°45'	II-10	0650	12.5	0-64	415.0	1.552
83.70	33°15'	121°25'	II-10	0040	12.25	0-69	397.6	1.746
83.80	32°56'	122°04'	II-9	1835	12.25	0-72	378.3	1.908
83.90	32°38'	122°41'	II-9	1250	12.5	0-71	379.3	1.869
87.35	33°50'	118°37.5'	II-7	1815	23.0	0-72	646.7	1.110

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N.lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
53.54	38°58'	124°00'	VIII-5	1605	12.25	0-67	467.4	1.433
57.54	38°24'	123°35'	VIII-5	0820	14.0	0-64	496.5	1.279
C-60.60	37°37'	123°37'	VIII-9	1930	22.75	0-80	529.6	1.507
60.70	37°17'	124°21'	VIII-10	0115	12.0	0-68	349.4	1.949
60.80	36°57.5'	125°04'	VIII-10	0645	13.25	0-70	382.9	1.815
60.90	36°39'	125°47'	VIII-10	1205	12.25	0-70	351.9	1.995
60.100	36°19'	126°31'	VIII-10	1805	12.0	0-65	369.9	1.763
60.110	35°58'	127°12.5'	VIII-10	2330	12.25	0-70	363.2	1.922
60.120	35°39'	127°55'	VIII-11	0555	12.25	0-70	374.9	1.859
60.130	35°15.7'	128°36.7'	VIII-11	1155	12.0	0-69	362.8	1.907
61.55	37°35.7'	123°09'	VIII-9	1520	22.25	0-70	620.0	1.126
63.57	37°09'	122°58.4'	VIII-9	1040	22.75	0-70	642.5	1.088
67.55	36°38.7'	122°26'	VIII-9	0440	27.0	0-74	689.6	1.072
70.55	35°47.5'	122°10.5'	VIII-13	2120	12.5	0-70	359.2	1.963
70.60	35°40'	122°30'	VIII-13	1750	12.75	0-70	373.1	1.876
70.70	35°23'	123°10'	VIII-13	1210	12.5	0-78	310.8	2.506
70.80	35°06.5'	123°51.5'	VIII-13	0635	13.5	0-76	374.6	2.037
70.90	34°49'	124°31.5'	VIII-13	0040	12.5	0-75	358.5	2.086
70.100	34°33'	125°12'	VIII-12	1910	12.5	0-73	356.6	2.058
70.110	34°19.5'	125°54'	VIII-12	1345	12.5	0-71	358.7	1.979
70.120	33°57'	126°34'	VIII-12	0810	12.75	0-71	364.8	1.955
70.130	33°35'	127°14.5'	VIII-11	2400	12.25	0-70	368.7	1.912
73.51	35°29.5'	121°14'	VIII-14	0355	12.5	0-61	386.9	1.566
77.55	34°52.5'	121°08.5'	VIII-14	0845	12.0	0-70	339.2	2.076
80.55	34°19'	120°48'	VIII-14	1350	12.25	0-70	366.6	1.909
80.60	34°09'	121°09'	VIII-14	1735	12.0	0-68	339.9	2.006
80.70	33°49'	121°47.5'	VIII-15	0005	12.5	0-71	324.5	2.197
80.80	33°28.5'	122°26.5'	VIII-15	0540	12.25	0-72	339.2	2.114
80.90	33°09'	123°05'	VIII-15	1135	12.25	0-70	355.1	1.977
80.100	32°43.5'	123°44'	VIII-15	1650	12.0	0-68	346.6	1.965
80.110	32°28'	124°23'	VIII-15	2205	12.5	0-71	368.3	1.928
80.120	32°07'	125°03'	VIII-16	0335	12.0	0-70	351.9	1.989
80.130	31°45.5'	125°41.5'	VIII-16	0850	12.25	0-69	354.8	1.936
90.30	33°24'	117°54.7'	VIII-19	0100	12.75	0-68	379.7	1.786
90.37	33°11'	118°23.5'	VIII-18	2010	12.0	0-70	362.4	1.937
90.45	32°54.5'	118°56.3'	VIII-18	1535	12.5	0-73	358.0	2.045
90.53	32°39.3'	119°29.5'	VIII-18	1045	12.25	0-71	352.6	2.014
90.60	32°24.8'	119°59.3'	VIII-18	0530	12.0	0-68	367.6	1.864
90.70	32°05'	120°40'	VIII-18	0010	12.5	0-71	379.7	1.873
90.80	31°45'	121°19'	VIII-17	1900	22.75	0-71	620.7	1.137
90.90	31°35.5'	121°56.5'	VIII-17	1345	22.75	0-70	676.4	1.042
90.100	31°14.1'	122°38'	VIII-17	0805	12.0	0-70	387.6	1.803
90.110	30°52.8'	123°18'	VIII-17	0305	12.5	0-65	384.9	1.686
90.120	30°31'	125°58.6'	VIII-16	2005	12.25	0-68	363.3	1.880

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
87.40	33°40'	118°58'	II-7	2215	23.25	0-73	604.4	1.214
87.50	33°20'	119°39'	II-8	0405	12.0	0-35	336.8	1.042
87.60	33°00'	120°23'	II-8	1035	12.5	0-70	343.0	2.055
87.70	32°40'	121°05'	II-8	1640	13.5	0-74	389.6	1.894
87.80	32°20'	121°42'	II-8	2225	12.5	0-68	394.1	1.728
87.90	32°00'	122°24'	II-9	0515	12.5	0-76	338.7	2.244
90.30	33°24.5'	117°55'	II-7	1205	23.0	0-68	690.2	.985
90.37	33°13'	118°24'	II-7	0725	23.0	0-72	602.0	1.196
90.45	33°00'	118°56'	II-7	0150	23.25	0-74	631.4	1.164
90.53	32°42'	119°30'	II-6	2105	23.0	0-69	703.4	.985
90.60	32°30'	119°55.5'	II-6	1635	12.5	0-74	361.1	2.058
90.70	32°06'	120°38'	II-6	1100	12.5	0-70	351.0	2.000
90.80	31°45'	121°19'	II-6	0425	22.25	0-71	601.6	1.175
90.90	31°25'	122°00'	II-5	2220	23.0	0-72	574.3	1.254
90.100	31°05'	122°40'	II-5	1545	22.5	0-68	620.7	1.104
90.110	30°45'	123°20'	II-5	0950	21.25	0-62	744.6	.826
90.120	30°24.5'	124°00'	II-5	0314	23.0	0-70	673.5	1.038
93.30	32°50'	117°31'	II-11	0440	12.0	0-68	372.9	1.837
93.40	32°28'	118°12'	II-11	0930	13.0	0-70	388.8	1.813
93.50	32°08'	118°55'	II-11	1810	12.5	0-65	386.6	1.676
93.60			Not occupied					
93.70	31°30'	120°14'	II-12	0445	13.0	0-76	362.0	2.113
93.80	31°07.5'	120°55'	II-12	1235	12.5	0-73	336.6	2.166
93.90	30°49'	121°31'	II-12	1725	13.0	0-75	374.0	2.000
97.32	32°11'	117°17'	II-14	1130	12.0	0-72	358.9	2.014
97.40	31°55'	117°50'	II-14	0645	13.0	0-73	365.6	2.002
97.50	31°35'	118°30'	II-14	0035	13.0	0-66	393.8	1.673
97.60	31°13'	119°11'	II-13	1810	12.5	0-61	416.9	1.458
97.70	30°52'	119°50'	II-13	1210	12.0	0-71	357.1	1.997
97.80	30°31'	120°31'	II-13	0555	12.5	0-76	340.3	2.245
97.90	30°16'	121°09.5'	II-12	2340	12.5	0-70	386.8	1.812
H-100.30	31°40.5'	116°46.5'	II-12	1530	24.0	0-59	881.2	.670
100.40	31°21'	117°27'	II-12	0935	23.25	0-68	683.8	.989
100.50	31°01'	118°07'	II-12	0240	24.0	0-68	705.8	.959
100.60	30°41'	118°47.5'	II-11	2235	24.5	0-66	698.3	.951
100.70	30°20.5'	119°27'	II-11	1825	23.0	0-70	722.7	.962
100.80	30°01'	120°07'	II-11	1315	24.25	0-73	630.2	1.165
100.90	29°40.5'	120°47'	II-11	0555	23.0	0-70	725.3	.962
100.100	29°20.5'	121°27'	II-10	2350	23.25	0-71	666.1	1.063
100.110	29°00.5'	122°07'	II-10	1720	21.0	0-75	602.6	1.246
100.120	28°40.5'	122°46'	II-10	1105	23.25	0-67	743.6	.896
105.35	30°39'	116°33'	I-31	0250	25.5	0-71	768.5	.920
110.35	29°46.5'	116°00'	II-7	2145	24.5	0-80	508.1	1.569
110.40	29°36.5'	116°19.5'	II-8	0140	23.25	0-65	792.5	.820

Table I (cont'd)

Record of Oblique Hauls made with Clarke-Bumpus Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
110.50	29°16.5'	116°59'	II-8	0735	22.5	0-65	704.6	.918
110.60	28°56.5'	117°39'	II-8	1350	23.25	0-78	648.2	1.197
110.70	28°36.5'	118°18'	II-8	1945	24.0	0-78	591.8	1.310
110.80	28°16.5'	118°57.5'	II-9	0215	24.25	0-70	737.5	.948
110.90	27°56.5'	119°36'	II-9	0825	23.0	0-65	738.8	.876
110.100	27°36.5'	120°15'	II-9	1410	23.25	0-67	726.5	.924
110.110	27°16.5'	120°54.5'	II-9	2055	23.0	0-72	670.1	1.073
115.40	28°45'	115°46.5'	II-7	1350	23.5	0-70	693.8	1.009
120.35	28°03'	114°54'	II-6	1000	14.5	0-46	359.8	1.278
120.45	27°43'	115°33'	II-6	0350	23.5	0-63	687.4	.921
120.50	27°33'	115°52.5'	II-5	2300	23.0	0-69	620.9	1.110
120.60	27°13'	116°31.5'	II-5	1715	24.5	0-64	810.5	.791
120.70	26°52.5'	117°10'	II-5	1040	23.0	0-74	644.0	1.151
120.80	26°32.5'	117°48.5'	II-5	0435	23.0	0-64	772.7	.824
120.90	26°13'	118°27.5'	II-5	0025	24.5	0-59	858.7	.684
120.100	25°53'	119°06'	II-4	1605	23.5	0-63	826.8	.760
120.110	25°33'	119°44'	II-4	1015	22.25	0-61	803.5	.759
123.40	27°18'	114°51.5'	II-1	0235	24.0	0-71	686.8	1.031
123.50	26°58'	115°30.5'	II-1	0705	23.0	0-72	631.2	1.144
123.60	26°38.5'	116°09'	II-1	1225	23.25	0-63	725.7	.871
127.40	26°43.5'	114°29.5'	II-2	0740	22.75	0-62	780.2	.788
127.50	26°23.5'	115°08'	II-2	0115	23.25	0-71	525.1	1.350
127.60	26°03.5'	115°46.5'	II-1	1925	23.5	0-68	778.2	.873
130.35	26°19'	113°48.5'	II-2	1400	27.0	0-55	996.5	.555
130.40	26°09'	114°07.5'	II-2	1700	23.5	0-69	693.4	1.001
130.50	25°49'	114°48.5'	II-2	2245	23.0	0-70	700.8	.996
130.60	25°29'	115°24'	II-3	0500	23.5	0-62	810.1	.771
130.70	25°08.5'	116°02'	II-3	1105	23.25	0-76	589.5	1.298
130.80	24°48.5'	116°40'	II-3	1720	23.5	0-68	671.9	1.009
Cruise 12								
B-40.45			Not quantitative					
40.50	41°23'	125°23'	III-13	0930	23.5	0-73	703.3	1.035
40.60	41°03'	126°09'	III-13	0325	12.75	0-68	422.5	1.605
40.70	40°42'	126°55'	III-12	2150	12.75	0-68	464.8	1.461
40.80	40°23'	127°40'	III-12	1635	12.25	0-69	419.1	1.653
40.90	40°02'	128°25'	III-12	1015	12.0	0-64	445.6	1.443
40.100	39°42'	129°10	III-12	0400	13.0	0-69	410.5	1.676
40.110	39°23'	129°55'	III-11	2150	24.25	0-67	810.7	.830
43.50	40°48'	124°57'	III-13	2345	23.25	0-73	750.0	.969
43.60	40°28'	125°43'	III-14	0415	23.0	0-73	732.9	.991
47.55	40°04'	124°55'	III-14	1530	14.0	0-68	505.0	1.343
47.60 *	39°54'	125°18'	III-14	1105	23.0	0-73	810.0	.904
50.55 *	39°30'	124°30'	III-8	1605	22.75	0-71	748.3	.950
50.60	39°20'	124°52'	III-8	2220	23.75	0-71	748.0	.953

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
50.70	39°00'	125°36.5'	III-9	0330	22.5	0-72	710.4	1.021
50.80	38°40'	126°21'	III-9	1335	12.75	0-68	416.0	1.647
50.90	38°20'	127°05'	III-9	2155	14.0	0-70	430.2	1.634
50.100	38°00'	127°49'	III-10	0600	12.75	0-71	428.7	1.656
50.110	37°40'	128°33'	III-10	1225	23.5	0-68	717.6	.946
50.120	37°20'	129°16.5'	III-10	1935	23.0	0-74	627.2	1.172
50.130	37°00'	130°00'	III-11	0400	25.25	0-66	758.3	.872
55.60	38°28.5'	124°14'	III-8	0345	24.25	0-70	838.9	.837
60.60	37°37'	123°37'	III-7	1045	13.25	0-67	403.8	1.667
60.70	37°17'	124°21'	III-7	0400	23.25	0-67	673.9	.996
60.80	36°57'	125°04'	III-6	1945	23.25	0-72	715.1	1.003
60.90	36°37'	125°47'	III-6	1245	23.75	0-66	729.6	.902
60.100	36°17'	126°30'	III-6	0435	22.25	0-75	654.2	1.145
60.110	35°57'	127°12'	III-5	2215	24.25	0-68	730.5	.930
60.120*	35°37'	127°54.5'	III-5	1425	23.0	0-71	756.3	.939
60.130	35°17'	128°37'	III-5	0445	23.5	0-71	740.3	.945
61.55	37°37'	123°07.5'	III-7	1755	23.75	0-63	879.2	.715
65.60	36°45'	123°00'	III-1	2145	16.5	0-69	522.5	1.321
70.55	36°03'	122°02'	III-2	0830	15.0	0-65	492.5	1.324
70.60	35°53'	122°23'	III-2	1410	24.0	0-68	833.6	.810
70.70	35°33'	123°06'	III-2	2125	25.0	0-69	784.0	.875
70.80	35°13'	123°48'	III-3	0410	13.0	0-64	425.4	1.511
70.90	34°53'	124°30'	III-3	1045	14.25	0-70	461.1	1.514
70.100	34°33'	125°12'	III-3	1710	23.0	0-69	782.9	.879
70.110	34°13'	125°54'	III-3	2350	24.5	0-68	795.4	.852
70.120	33°53'	126°35.5'	III-4	0645	13.0	0-65	550.9	1.176
70.130	33°33'	127°16.5'	III-4	1230	13.0	0-66	451.8	1.454
C-80.55	34°19'	120°48'	III-2	1115	23.25	0-70	695.5	1.011
80.60	34°09'	121°09'	III-2	1525	22.25	0-73	626.4	1.167
80.70	33°48'	121°50'	III-2	2145	14.25	0-74	420.8	1.756
80.80	33°26'	122°32'	III-3	0420	13.5	0-69	414.3	1.670
80.90	33°03.5'	123°13'	III-3	Not quantitative				
80.100	32°48'	123°56'	III-3	1750	13.75	0-73	403.1	1.809
80.110	32°29'	124°34'	III-4	0045	13.5	0-69	451.2	1.531
80.120	32°10'	125°13'	III-4	0740	23.0	0-69	716.7	.957
80.130	31°49'	125°56'	III-4	1555	23.5	0-70	715.5	.974
83.55			Not occupied					
83.60			Not occupied					
83.70			Not occupied					
P-83.80	32°55'	122°06'	III-10	1545	12.25	0-68	360.5	1.884
83.90	32°42'	122°49'	III-10	0830	22.25	0-60	771.9	.780
87.35	33°50'	118°38'	III-12	1600	22.5	0-65	756.2	.854
87.40	33°40'	118°58'	III-12	2025	13.0	0-64	456.5	1.391
87.50	33°20'	119°39'	III-13	0140	07.0	0-36	228.4	1.554

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
87.60	32°59'	120°21'	III-13	0855	12.75	0-67	438.9	1.531
87.70			No sample taken due to loss of gear					
87.80			Not occupied					
87.90			Not occupied					
90.30	33°24.5'	117°55.6'	III-16	0220	13.25	0-71	(394.3)	1.791
90.37	33°11'	118°23.5'	III-16	0750	12.75	0-69	(385.4)	1.790
90.45	32°54.5'	118°56'	III-16	1340	11.75	0-67	(377.4)	1.765
90.53	32°38.5'	119°29'	III-16	1940	13.0	0-75	(352.1)	2.127
90.60			Not occupied					
90.70			Not occupied					
90.80			Not occupied					
C-90.90	31°23'	122°07'	III-6	0625	23.0	0-73	606.5	1.210
90.100	31°05'	122°40'	III-5	2255	22.75	0-73	632.3	1.153
90.110*	30°46'	123°21'	III-5	1545	24.75	0-71	769.1	.926
90.120*	30°25'	124°01'	III-5	0755	25.0	0-68	840.0	.808
P-93.30	32°50'	117°31.5'	III-18	0625	12.5	0-62	(433.6)	1.423
93.40	32°30'	118°12.5'	III-17	2335	12.5	0-70	(330.5)	1.832
93.50	32°10'	118°53.5'	III-17	1610	14.0	0-70	(420.2)	1.656
93.60	31°42'	119°15'	III-17	0835	12.5	0-68	(392.9)	1.721
93.70			Not occupied					
93.80			Not occupied					
93.90			Not occupied					
97.32			Not occupied					
97.40			Not occupied					
97.50			Not occupied					
97.60			Not occupied					
97.70			Not occupied					
97.80			Not occupied					
97.90			Not occupied					
H-100.30	31°42.2'	116°48.5'	III-15	0040	23.0	0-74	696.0	1.059
100.40	31°23'	117°24'	III-14	1820	12.0	0-63	419.0	1.506
100.50	31°04'	118°05'	III-14	1215	23.0	0-56	781.4	.723
100.60	30°45'	118°43'	III-14	0635	22.5	0-61	697.4	.876
100.70	30°23.8'	119°26.8'	III-14	0030	12.25	0-63	438.2	1.438
100.80	30°04'	120°07.5'	III-13	1850	23.25	0-62	720.1	.862
100.90	29°44'	120°47'	III-13	1250	22.75	0-71	713.3	.997
100.100	29°20.5'	121°27'	III-13	0640	23.0	0-78	700.3	1.107
100.110	29°01'	122°07'	III-13	0045	22.75	0-62	837.9	.734
100.120*	28°40'	122°45'	III-12	1900	24.0	0-72	673.0	1.067
105.35	30°39'	116°33'	III-2	0020	23.75	0-65	(618.1)	.795
110.35	29°46.5'	116°00'	III-9	1805	22.25	0-68	800.2	.856
110.40	29°36.5'	116°19'	III-9	2135	22.5	0-76	(702.3)	1.086
110.50	29°15'	116°59'	III-10	0350	23.0	0-75	(723.0)	1.037
110.60	28°53'	117°39'	III-10	0915	23.75	0-74	783.9	.938

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
110.70	28°39'	118°18'	III-10	1315	23.5	0-76	695.7	1.088
110.80	28°13.5'	118°57.5'	III-11	1020	23.0	0-72	724.4	.990
110.90	27°56.5'	119°36'	III-11	1550	22.5	0-61	844.9	.724
110.100	27°36.5'	120°15'	III-11	2125	22.75	0-77	710.1	1.086
110.110	27°16.5'	120°55'	III-12	0450	22.75	0-68	833.3	.810
113.35	29°12'	115°39'	III-9	1325	22.75	0-69	833.3	.828
117.35	28°37'	115°16'	III-9	0820	22.25	0-70	665.9	1.050
120.35	28°03'	114.54'	III-9	0445	19.0	0-56	615.7	.906
120.45*	27°40'	115°32'	III-8	0610	25.5	0-68	863.5	.791
120.50	27°31'	115°52.6'	III-8	0125	23.25	0-56	932.7	.599
120.60	27°14.2'	116°32'	III-7	1900	22.5	0-63	840.7	.752
120.70	26°54.5'	117°10'	III-7	1320	23.25	0-63	874.3	.725
120.80	26°33.5'	117°51'	III-7	0640	23.5	0-71	770.5	.921
120.90	26°14'	118°27'	III-7	0020	22.25	0-72	722.4	.999
120.100	25°53'	119°04'	III-6	1935	23.0	0-70	778.1	.905
120.110*	25°30.7'	119°44'	III-6	1200	24.5	0-66	752.7	.878
123.40	27°18'	114°51.5'	III-2	2145	25.25	0-80	(808.9)	.988
123.50	26°55.5'	115°30.7'	III-3	0415	22.75	0-75	702.9	1.067
123.60	26°30'	116°16'	III-3	1050	23.25	0-72	776.7	.924
127.40	26°43.5'	114°30'	III-4	0515	23.0	0-71	779.1	.906
127.50	26°23'	115°08'	III-3	2310	23.5	0-79	640.3	1.240
127.60	26°03'	115°46.3'	III-3	1655	22.75	0-77	723.2	1.063
130.35	26°10.4'	113°46.3'	III-4	1150	22.5	0-70	743.3	.935
130.40	26°09'	114°03'	III-4	1605	23.5	0-72	765.1	.944
130.50	25°51.5'	114°45'	III-4	2045	23.0	0-72	716.5	1.011
130.60	25°31'	115°30'	III-5	0450	22.5	0-64	799.2	.803
130.70	25°08.5'	116°02'	III-5	1115	23.0	0-72	814.8	.890
130.80	24°49'	116°40'	III-5	1740	22.75	0-70	760.5	.914
Cruise 13								
B-40.45	41°33'	125°00'	IV-15	2045	14.0	0-68	521.0	1.309
40.50	41°23'	125°23'	IV-15	1625	23.5	0-68	879.8	.775
40.60	41°03'	126°09'	IV-15	1045	22.75	0-70	779.2	.897
40.70	40°42'	126°55	IV-15	0505	13.75	0-69	464.8	1.480
40.80 *	40°23'	127°40'	IV-14	2220	13.75	0-70	424.3	1.657
40.90	40°02'	128°25'	IV-14	1455	23.0	0-68	786.9	.870
40.100	39°42'	129°10'	IV-14	0820	25.0	0-69	723.9	.950
40.110	39°23'	129°55'	IV-14	0335	13.75	0-68	445.5	1.515
43.50	40°48'	124°57'	IV-16	1350	13.0	0-70	482.0	1.452
43.60	40°28'	125°43'	IV-16	1025	24.0	0-70	826.4	.851
47.55 *	40°04'	124°55'	IV-16	2140	13.25	0-73	419.0	1.733
47.60	39°54'	125°18'	IV-16	1640	22.75	0-71	789.1	.898
50.55	39°30'	124°30'	IV-10	1415	23.75	0-68	918.7	.735
50.60	39°20'	124°52'	IV-10	1855	23.75	0-70	841.7	.828
50.70 *	39°00'	125°36.5'	IV-11	0120	24.25	0-70	815.7	.861

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
50.80	38°40'	126°21'	IV-11	1225	23.25	0-77	556.5	1.384
50.90	38°20'	127°05'	IV-11	1940	25.5	0-66	880.2	.754
50.100	38°00'	127°49'	IV-12	0620	13.25	0-71	440.1	1.622
50.110	37°40'	128°33'	IV-12	1135	14.75	0-66	536.8	1.224
50.120	37°20'	129°16.5'	IV-12	1905	13.75	0-70	465.6	1.497
50.130	37°00'	130°00'	IV-13	0300	15.5	0-70	481.3	1.454
55.60	38°23.5'	124°14'	IV-10	0350	13.25	0-70	487.0	1.446
60.60	37°35'	123°40'	IV-9	1120	13.0	0-70	469.2	1.503
60.70 *	37°17'	124°21'	IV-9	0440	23.75	0-70	718.5	.973
60.80	36°57'	125°04'	IV-8	2105	15.75	0-68	562.9	1.203
60.90	36°37'	125°47'	IV-8	1420	22.75	0-68	883.6	.771
60.100	36°17'	126°30'	IV-8	0900	23.25	0-69	1033.7	.669
60.110	35°57'	127°12'	IV-7	2305	24.25	0-66	820.3	.798
60.120	35°37'	127°54.5'	IV-7	1625	23.75	0-69	895.2	.771
60.130	35°17'	128°37'	IV-7	0840	23.25	0-69	815.1	.851
61.55	37°37'	123°07.5'	IV-9	1725	23.25	0-68	889.7	.769
65.60	36°45'	123°00'	IV-3	2220	21.0	0-58	741.2	.778
70.55	36°04'	122°03'	IV-4	0750	13.5	0-68	613.5	1.113
70.60	35°53'	122°23'	IV-4	1320	13.75	0-70	604.7	1.166
70.70	35°33'	123°06'	IV-4	2020	13.0	0-63	515.6	1.222
70.80	35°13'	123°48'	IV-5	0305	25.5	0-69	812.6	.852
70.90	34°53'	124°30'	IV-5	1005	12.25	0-63	515.7	1.214
70.100	34°33'	125°12'	IV-5	1630	11.75	0-70	491.4	1.420
70.110	34°13'	125°54'	IV-5	2300	23.25	0-63	908.2	.691
70.120	33°53'	126°35.5'	IV-6	0630	23.25	0-71	803.7	.885
70.130	33°33'	127°16.5'	IV-6	1225	23.0	0-69	843.3	.819
H-80.55	34°21'	120°50'	IV-4	0840	14.25	0-71	479.3	1.481
80.60	34°09'	121°09'	IV-4	1300	12.25	0-72	434.0	1.664
80.70	33°49'	121°51'	IV-4	1845	12.75	0-61	485.9	1.251
80.80	33°30'	122°37'	IV-5	0100	13.25	0-66	419.8	1.577
80.90	33°09'	123°13'	IV-5	0640	13.0	0-65	443.5	1.468
80.100	32°49'	123°54'	IV-5	1305	11.5	0-59	458.9	1.294
80.110	32°29'	124°34.5'	IV-5	1850	12.5	0-69	439.8	1.564
80.120	32°08'	125°16'	IV-6	0130	12.75	0-75	391.1	1.931
80.130*	31°49.5'	125°58'	IV-6	1105	23.75	0-70	823.7	.852
83.55	33°42'	120°24'	IV-12	0410	12.25	0-55	610.0	.898
83.60	33°34'	120°45'	IV-11	2355	14.0	0-77	395.6	1.936
83.70	33°13'	121°24'	IV-11	1730	13.25	0-71	475.1	1.497
83.80	32°56'	122°05'	IV-11	1145	12.75	0-74	424.4	1.751
83.90	32°29'	122°46.5'	IV-11	0525	13.0	0-69	458.9	1.493
87.35	33°50'	118°37'	IV-9	1630	12.5	0-68	450.1	1.504
87.40	33°40'	118°58'	IV-9	1845	15.0	0-71	487.9	1.447
87.50			Not occupied					
87.60	32°55'	120°22'	IV-10	0435	12.5	0-81	377.4	2.138
87.70	32°39'	121°06'	IV-10	1035	13.5	0-89	291.8	3.040

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
87.80	32°18.5'	121°41'	IV-10	1625	12.75	0-77	391.7	1.971
87.90	31°54.5'	122°22'	IV-10	2310	12.25	0-74	407.2	1.822
90.30	33°24'	117°55'	IV-9	0935	13.0	0-67	445.3	1.500
90.37	33°11'	118°23'	IV-9	0450	13.0	0-71	460.5	1.544
90.45	32°54'	118°56'	IV-8	2335	14.5	0-76	405.0	1.877
90.53	32°36'	119°28'	IV-8	1840	14.25	0-73	393.8	1.849
90.60	32°26'	119°56'	IV-8	1405	13.75	0-77	404.7	1.890
90.70	32°06'	120°37'	IV-8	0740	24.5	0-68	1014.8	.666
90.80	31°47'	121°15'	IV-8	0150	14.0	0-77	381.8	2.019
90.90	31°25'	121°59'	IV-7	1940	22.5	0-74	733.2	1.009
90.100	31°03'	122°42'	IV-7	1355	23.0	0-77	730.8	1.052
90.110	30°39'	123°24'	IV-7	0655	22.0	0-63	869.0	.725
90.120	30°22'	124°02'	IV-6	2320	23.0	0-69	846.1	.817
93.30	32°51'	117°32'	IV-12	1905	12.5	0-77	387.6	1.992
93.40	32°30'	118°12.5'	IV-13	0045	13.5	0-71	449.8	1.567
93.50	32°10'	118°53.5'	IV-13	0720	14.0	0-83	330.8	2.512
93.60	31°50'	119°34'	IV-13	1520	13.0	0-75	318.9	2.361
93.70			Not occupied					
93.80			Not occupied					
93.90			Not occupied					
97.32	32°11.5'	117°17'	IV-15	0855	12.25	0-63	439.0	1.433
97.40	31°55'	117°56'	IV-15	0435	12.75	0-69	452.3	1.521
97.50	31°37'	118°30.5'	IV-15	0040	12.5	0-71	420.7	1.692
97.60			Not occupied					
97.70	30°55'	119°50.5'	IV-14	1715	13.75	0-60	461.3	1.309
97.80	30°30'	120°34'	IV-14	1140	13.0	0-84	359.7	2.344
97.90	30°13'	121°14'	IV-14	0600	13.5	0-81	345.5	2.356
C-100.30	31°40.8'	116°47'	IV-17	0050	12.25	0-69	374.2	1.852
100.40	31°20'	117°27'	IV-16	1655	22.25	0-65	554.0	1.177
100.50	30°59'	118°08'	IV-16	1050	22.5	0-69	642.6	1.077
100.60	30°40'	118°50'	IV-16	0430	23.0	0-69	625.3	1.107
100.70	30°19.5'	119°29.5'	IV-15	2215	22.25	0-67	652.1	1.029
100.80	29°57.2'	120°10'	IV-15	1610	23.25	0-71	708.6	1.002
100.90	29°36'	120°49'	IV-15	1020	22.5	0-70	703.2	.991
100.100	29°17'	121°29'	IV-15	0400	22.5	0-70	674.1	1.040
100.110	28°57.5'	122°08.5'	IV-14	2145	22.5	0-71	685.2	1.033
100.120	28°39.5'	122°48.5'	IV-14	1535	22.75	0-72	645.6	1.111
105.35	30°39'	116°32.7'	IV-3	2240	22.75	0-65	677.7	.961
110.35	29°46.5'	116°01'	IV-11	1425	22.5	0-69	511.7	1.341
110.40	29°36.5'	116°20'	IV-11	1815	22.5	0-69	666.8	1.029
110.50	29°13.5'	116°59'	IV-12	0000	22.5	0-67	689.1	.972
110.60	28°50'	117°40'	IV-12	0605	22.75	0-69	680.3	1.020
110.70	28°36'	118°18.5'	IV-12	2250	22.75	0-70	704.7	.990
110.80	28°15.8'	118°57'	IV-13	0440	22.5	0-71	675.3	1.045

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
110.90	28°00'	119°35'	IV-13	1035	22.5	0-67	661.0	1.020
110.100	27°38.7'	120°17.5'	IV-13	1605	22.5	0-70	689.1	1.014
110.110	27°22'	120°53'	IV-13	2155	22.5	0-70	685.6	1.018
113.35	29°12.5'	115°39'	IV-11	0820	22.5	0-73	614.7	1.188
117.35	28°36.8'	115°16'	IV-11	0250	22.5	0-71	657.3	1.076
120.35	28°03.8'	114°54.6'	IV-10	0830	11.75	0-72	362.1	1.988
120.45	27°39.5'	115°32'	IV-10	0020	22.75	0-71	665.4	1.073
120.50	27°31'	115°54'	IV-9	2035	22.5	0-69	685.6	1.011
120.60	27°13.5'	116°33'	IV-9	1500	22.5	0-70	711.3	.981
120.70	26°51.5'	117°14'	IV-9	1025	22.5	0-71	684.5	1.036
120.80	26°32.2'	117°51.2'	IV-9	0430	22.75	0-72	661.0	1.089
120.90	26°12.5'	118°29'	IV-8	2135	23.0	0-68	705.7	.965
120.100	25°52.5'	119°06'	IV-8	1635	22.5	0-67	711.5	.938
120.110*	25°31'	119°46'	IV-8	1120	23.5	0-71	695.3	1.021
123.40	27°16.2'	114°51'	IV-5	0335	23.25	0-70	621.5	1.130
123.50	27°02'	115°30'	IV-5	0915	22.5	0-70	670.1	1.040
123.60	26°38'	116°09'	IV-5	1410	22.75	0-70	670.4	1.047
127.40	26°43'	114°29.5'	IV-6	0725	22.5	0-68	643.6	1.050
127.50	26°21.3'	115°11.5'	IV-6	0100	23.0	0-73	616.8	1.187
127.60	26°04'	115°46.8'	IV-5	2005	23.25	0-71	653.8	1.091
130.35	26°16'	113°45'	IV-6	1420	22.75	0-69	663.1	1.039
130.40	26°09'	114°07.3'	IV-6	1740	22.75	0-71	542.6	1.309
130.50	25°49'	114°46.5'	IV-6	2335	23.75	0-68	681.0	.994
130.60	25°29'	115°24'	IV-7	0440	22.5	0-68	696.0	.973
130.70	25°12'	116°02.8'	IV-7	1125	23.0	0-69	693.1	.993
130.80 *	24°49'	116°40'	IV-7	1755	24.75	0-69	700.0	.983
Cruise 14								
B-40.45 *	41°33'	125°00'	V-16	1820	13.5	0-69	401.2	1.730
40.50	41°23'	125°23'	V-16	1135	13.75	0-63	516.6	1.218
40.60	41°03'	126°09'	V-16	0410	13.5	0-71	(377.8)	1.871
40.70	40°42'	126°55'	V-15	2045	14.0	0-73	(364.5)	2.008
40.80	40°23'	127°40'	V-15	1245	24.5	0-72	609.9	1.187
40.90	40°02'	128°25'	V-15	0325	24.75	0-71	806.3	.886
40.100	39°42'	129°10'	V-14	1730	23.75	0-74	598.0	1.246
40.110 *	39°23'	129°55'	V-14	0715	25.0	0-70	786.6	.892
43.50	40°48'	124°57'	V-16	2315	14.25	0-68	478.2	1.416
43.60	40°28'	125°43'	V-17	0620	24.0	0-65	795.4	.813
47.55			Not quantitative					
47.60	39°54'	125°18'	V-17	1210	24.25	0-74	733.2	1.011
50.55	39°30'	124°30'	V-10	2200	13.0	0-58	438.9	1.326
50.60	39°20'	124°52'	V-11	0310	24.5	0-75	575.1	1.297
50.70	39°00'	125°36.5'	V-11	1055	23.25	0-70	559.9	1.259
50.80	38°40'	126°21'	V-11	1755	23.25	0-64	983.3	.650
50.90	38°20'	127°05'	V-12	0020	14.0	0-73	444.5	1.649

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
50.100	38°00'	127°45'	V-12	0725	13.75	0-69	289.5	2.383
50.110	37°40'	128°33'	V-12	1415	14.0	0-69	204.3	3.373
50.120	37°20'	129°16.5'	V-12	2040	14.25	0-68	476.0	1.431
50.130	37°00'	130°00'	V-13	0335	24.75	0-66	817.5	.807
55.60 *	38°28.5'	124°14'	V-10	0340	14.5	0-71	415.0	1.706
60.60	37°37'	123°37'	V-8	1905	13.5	0-69	(397.1)	1.743
60.70	37°17'	124°21'	V-8	1055	24.5	0-69	(719.4)	.961
60.80	36°57'	125°04'	V-8	0105	15.0	0-70	324.3	2.152
60.90	36°37'	125°47'	V-7	1630	15.25	0-66	(490.6)	1.343
60.100	36°18'	126°30'	V-7	0640	30.5	0-65	(992.5)	.659
60.110	35°57'	127°12'	V-6	2050	13.25	0-61	584.3	1.044
60.120	35°37'	127°54.5'	V-6	1220	24.0	0-73	666.7	1.092
60.130	35°17'	128°37'	V-6	0305	23.75	0-69	551.3	1.250
61.55	37°37'	123°07.5'	V-9	0100	24.25	0-68	758.3	.903
65.60	36°45'	123°00'	V-2	2230	13.5	0-70	446.3	1.573
70.55	36°03'	122°02'	V-3	0455	13.5	0-68	453.0	1.512
70.60	35°53'	122°23'	V-3	0935	11.0	0-55	314.1	1.742
70.70	35°33'	123°06'	V-3	1625	13.0	0-66	436.9	1.506
70.80	35°13'	123°48'	V-3	2400	14.0	0-68	383.2	1.775
70.90	34°53'	124°30'	V-4	0705	13.25	0-67	467.0	1.426
70.100	34°33'	125°12'	V-4	1410	24.0	0-68	588.9	1.151
70.110	34°13'	125°56'	V-4	2040	23.5	0-70	(672.4)	1.043
70.120	33°53'	126°35.5'	V-5	0345	24.0	0-68	(732.8)	.923
70.130	33°33'	127°16.5'	V-5	1000	23.25	0-70	761.7	.916
H-80.55	34°21'	120°50'	V-3	0805	25.0	0-61	1021.2	.599
80.60	34°10'	121°10'	V-3	1200	13.25	0-69	500.8	1.382
80.70	33°50'	121°51'	V-3	1805	13.5	0-69	488.4	1.421
80.80	33°28'	122°32'	V-4	0020	13.25	0-66	548.0	1.210
80.90	33°09'	123°13'	V-4	0640	13.0	0-59	482.9	1.230
80.100	32°49'	123°54'	V-4	1305	12.5	0-61	487.3	1.254
80.110	32°29'	124°34.5'	V-4	1855	12.5	0-73	411.5	1.781
80.120	32°09'	125°15.5'	V-5	0135	13.0	0-85	339.8	2.496
80.130	31°50'	125°57'	V-5	0700	12.75	0-74	448.2	1.656
83.55	33°44'	120°24.5'	V-12	0245	13.5	0-56	550.8	1.008
83.60	33°34'	120°45'	V-11	2235	12.75	0-72	420.6	1.705
83.70	33°14.5'	121°26'	V-11	1630	12.25	0-39	641.9	.604
83.80	32°49'	122°06'	V-11	0930	23.25	0-75	733.5	1.017
83.90	32°33'	122°47'	V-11	0355	23.0	0-70	784.8	.896
87.35	33°50'	118°37.5'	V-9	1105	12.0	0-73	454.0	1.604
87.40	33°40'	118°58.5'	V-9	1700	12.25	0-46	618.6	.740
87.50	33°20'	119°39.5'	V-9	2120	11.5	0-64	463.0	1.391
87.60	33°00'	120°21.5'	V-10	0255	13.0	0-71	444.9	1.600
87.70	32°40'	121°04'	V-10	0825	13.5	0-66	475.9	1.385
87.80	32°19.5'	121°43'	V-10	1520	23.0	0-65	838.6	.779

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
87.90	32°00'	122°25'	V-10	2045	23.75	0-49	1060.3	.460
90.30	33°24.5'	117°55'	V-8	1215	12.25	0-52	545.7	.951
90.37	33°11'	118°23.5'	V-8	0745	12.5	0-50	555.9	.890
90.45	32°56'	118°57'	V-8	0205	13.25	0-66	488.6	1.353
90.53	32°35'	119°26'	V-7	2045	12.75	0-63	442.7	1.432
90.60	32°25'	119°56'	V-7	1600	23.25	0-75	706.2	1.058
90.70	32°04.5'	120°39'	V-7	0835	22.75	0-66	810.6	.809
90.80	31°50'	121°19'	V-7	0315	23.75	0-81	669.6	1.214
90.90	31°27'	121°59'	V-6	2010	23.25	0-72	742.2	.971
90.100	31°04.5'	122°40'	V-6	1310	23.0	0-53	945.1	.558
90.110	30°46'	123°16'	V-6	0625	23.0	0-69	796.7	.869
90.120	30°24.5'	124°01'	V-5	2305	23.75	0-73	745.1	.982
93.30	32°50'	117°31.5'	V-12	1735	23.75	0-57	926.1	.611
93.40	32°30'	118°12.5'	V-12	2305	12.0	0-58	447.5	1.298
93.50	32°07'	118°57'	V-13	0445	14.0	0-43	634.2	.678
93.60	31°49'	119°34'	V-13	1105	22.5	0-69	756.1	.915
93.70	31°28'	120°16'	V-13	1710	23.0	0-63	876.4	.714
93.80	31°04'	120°58.5'	V-13	2325	13.0	0-71	442.7	1.595
93.90	30°37'	121°45'	V-14	0540	12.0	0-65	452.6	1.445
97.32	32°11.5'	117°17'	V-16	0030	12.5	0-71	457.0	1.545
97.40	31°56'	117°51'	V-15	1855	12.5	0-47	583.8	.802
97.50	31°36'	118°32'	V-15	1235	12.75	0-61	481.7	1.260
97.60	31°15.5'	119°10.5'	V-15	0635	12.0	0-45	591.1	.761
97.70	30°55'	119°50.5'	V-15	0055	13.25	0-72	403.3	1.951
97.80	30°35'	120°31'	V-14	1805	12.5	0-60	519.2	1.150
97.90	30°07.5'	121°11'	V-14	1205	12.75	0-88	352.1	2.499
C-100.30	31°40'	116°46'	V-15	1930	12.25	0-68	362.4	1.863
100.40	31°27'	117°21'	V-15	1405	23.25	0-71	575.7	1.233
100.50	31°07'	118°02'	V-15	0715	22.75	0-70	523.7	1.340
100.60	30°45'	118°44'	V-15	0135	23.5	0-71	623.3	1.145
100.70	30°25'	119°24'	V-14	2005	22.5	0-70	644.7	1.086
100.80	30°05'	120°04'	V-14	1420	23.25	0-71	634.8	1.120
100.90	29°43'	120°43'	V-14	0850	22.75	0-72	591.5	1.222
100.100	29°23'	121°25'	V-14	0300	23.25	0-73	567.9	1.287
100.110	29°04'	122°02'	V-13	2135	22.75	0-72	646.9	1.110
100.120	28°44'	122°38'	V-13	1535	23.5	0-72	658.1	1.099
105.35	30°33'	116°39'	V-2	2345	23.75	0-64	736.1	.867
110.35	29°40'	116°03'	V-11	0815	23.0	0-68	654.0	1.047
110.40	29°29'	116°22'	V-11	1055	23.75	0-67	684.6	.976
110.50	29°16'	116°59'	V-11	1635	22.75	0-68	712.1	.949
110.60	28°55'	117°40'	V-11	2215	23.5	0-68	683.5	.995
110.70	28°33'	118°24'	V-12	0355	22.75	0-70	691.7	1.015
110.80	28°17'	118°55'	V-12	0850	23.75	0-70	656.7	1.071
110.90	27°55'	119°35'	V-12	1515	23.0	0-70	652.2	1.070

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
110.100	27°38'	120°16'	V-12	2100	23.5	0-72	657.0	1.096
110.110	27°22'	120°55'	V-13	0230	22.75	0-72	643.8	1.112
113.35	29°11'	115°41'	V-11	0045	22.5	0-71	580.2	1.227
117.35	28°37'	115°16'	V-10	1915	23.0	0-66	722.3	.910
120.35	28°03'	114°54'	V-10	1420	19.25	0-56	363.0	1.537
120.45	27°42'	115°32'	V-9	1105	22.75	0-71	580.5	1.227
120.50	27°39'	115°53'	V-9	0635	23.5	0-73	678.7	1.070
120.60	27°20'	116°33'	V-9	0055	23.0	0-70	725.2	.961
120.70	27°03'	117°07'	V-8	1900	24.0	0-74	672.3	1.093
120.80	26°46'	117°53'	V-8	1315	22.75	0-69	729.5	.949
120.90	26°24'	118°32'	V-8	0850	23.5	0-72	688.1	1.042
120.100	26°00'	119°07.5'	V-8	0100	23.0	0-73	524.8	1.391
120.110*	25°38'	119°39'	V-7	1902	23.0	0-73	719.5	1.020
123.40	27°16'	114°54.5'	V-4	0325	13.75	0-68	419.1	1.613
123.50	26°57'	115°31'	V-4	0910	23.5	0-70	696.1	1.011
123.60	26°37.3'	116°09.5'	V-4	1440	23.0	0-74	691.7	1.070
127.40	26°39'	114°33'	V-5	0855	22.75	0-72	676.4	1.060
127.50	26°23'	115°08.5'	V-5	0255	22.5	0-71	556.3	1.282
127.60	26°05'	115°48'	V-4	2040	23.0	0-74	694.4	1.064
130.35	26°19'	113°48'	V-5	1535	22.5	0-71	499.9	1.420
130.40	26°10'	114°08'	V-5	1935	23.0	0-69	630.7	1.089
130.50	25°49'	114°45'	V-6	0205	23.75	0-72	653.5	1.103
130.60	25°28'	115°23'	V-6	0820	22.75	0-69	690.8	.993
130.70	25°08'	116°10'	V-6	1455	23.75	0-68	750.5	.902
130.80 *	24°55'	116°41'	V-6	2345	23.25	0-72	773.6	.937
Cruise 15								
B-40.45			Not occupied					
40.50			Not occupied					
40.60			Not occupied					
40.70	40°42'	126°55'	VI-20	1620	12.75	0-75	376.0	2.003
40.80	40°23'	127°40'	VI-20	0810	14.75	0-67	447.7	1.497
40.90	40°02'	128°25'	VI-20	0115	12.75	0-68	408.4	1.660
40.100	39°42'	129°10'	VI-19	1825	12.75	0-71	388.6	1.827
40.110	39°23'	129°55'	VI-19	1150	13.0	0-72	396.9	1.812
43.50			Not occupied					
43.60			Not occupied					
47.55			Not occupied					
47.60			Not occupied					
50.55	39°30'	124°30'	VI-16	1605	13.5	0-68	344.0	1.974
50.60	39°20'	124°52'	VI-16	2010	12.25	0-68	390.0	1.751
50.70	39°00'	125°36.5'	VI-17	0220	12.75	0-65	412.6	1.583
50.80	38°40'	126°21'	VI-17	0840	12.5	0-67	393.6	1.695
50.90	38°20'	127°05'	VI-17	1530	12.25	0-68	372.7	1.811
50.100	38°00'	127°49'	VI-17	2315	12.5	0-68	291.4	2.344

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
50.110	37°40'	128°33'	VI-18	0525	12.25	0-72	369.4	1.941
50.120	37°20'	129°16.5'	VI-18	1120	12.0	0-66	351.0	1.883
50.130	37°00'	130°00'	VI-18	1700	12.25	0-71	301.5	2.361
53.54	38°58'	124°00'	VI-16	1000	12.0	0-68	330.3	2.053
53.64	38°38'	124°44'	VI-15	0010	12.75	0-72	325.1	2.227
57.54	38°24'	123°35'	VI-15	0925	12.25	0-65	411.4	1.580
57.64	38°04'	124°19'	VI-15	1530	16.75	0-71	444.1	1.608
60.60	37°37'	123°37'	VI-14	1625	13.5	0-71	352.6	2.005
60.70	37°17'	124°21'	VI-14	0945	15.0	0-64	398.5	1.619
60.80	36°57'	125°04'	VI-14	0215	13.0	0-72	358.7	2.016
60.90	36°37'	125°47'	VI-13	1820	23.0	0-69	662.0	1.047
60.100	36°17'	126°30'	VI-13	1040	23.75	0-70	713.0	.985
60.110	35°57'	127°12'	VI-13	0330	14.0	0-72	380.1	1.889
60.120	35°37'	127°54.5'	VI-12	2000	25.5	0-72	733.5	.978
60.130	35°17'	128°37'	VI-12	1220	22.25	0-72	696.0	1.034
61.55	37°37'	123°07.5'	VI-14	2120	13.0	0-61	379.6	1.615
63.57	37°09'	122°58'	VI-5	1825	12.5	0-74	432.7	1.713
63.67	36°49'	123°41'	VI-6	0625	14.0	0-72	365.1	1.969
67.55	36°39'	122°26'	VI-7	0825	13.25	0-73	385.6	1.885
67.65	36°19'	123°09'	VI-6	1720	14.75	0-42	625.0	.670
70.55	36°03'	122°02'	VI-9	0935	18.75	0-81	662.0	1.221
70.60	35°53'	122°23'	VI-9	1435	23.25	0-69	605.7	1.142
70.70	35°33'	123°06'	VI-9	2100	26.5	0-66	542.5	1.226
70.80	35°13'	123°48'	VI-10	0430	24.0	0-68	382.2	1.771
70.90	34°53'	124°30'	VI-10	1050	22.25	0-68	443.6	1.542
70.100	34°33'	125°12'	VI-10	1805	14.25	0-77	342.7	2.247
70.110	34°13'	125°54'	VI-11	0135	24.75	0-67	642.7	1.046
70.120	33°53'	126°35.5'	VI-11	0950	23.0	0-70	585.5	1.196
70.130	33°33'	127°16.5'	VI-11	1705	24.0	0-70	561.5	1.248
C-73.51	35°35'	121°20'	VI-8	0705	12.5	0-76	382.3	1.998
73.61	35°15'	122°03'	VI-8	1235	12.75	0-68	412.7	1.645
77.55	34°54'	121°13'	VI-9	0010	13.75	0-67	(425.2)	1.578
77.65	34°34'	121°55'	VI-8	1745	12.5	0-78	387.4	2.008
80.55	34°19'	120°48'	VI-9	0510	13.0	0-75	417.1	1.803
80.60	34°09'	121°09'	VI-9	0910	12.75	0-82	357.6	2.293
80.70	33°49'	121°58'	VI-9	1450	12.75	0-69	403.7	1.709
80.80	33°31'	122°33'	VI-9	1950	12.25	0-68	385.2	1.752
80.90	33°12'	123°12'	VI-10	0205	12.0	0-70	359.1	1.941
80.100	32°49'	123°56'	VI-10	0755	11.75	0-69	363.5	1.901
80.110	32°29'	124°34'	VI-10	1325	12.0	0-69	384.1	1.799
80.120	32°09'	125°15'	VI-10	1930	12.0	0-67	380.9	1.756
80.130	31°49'	125°56'	VI-11	0120	12.0	0-70	384.3	1.829
83.55	33°41'	120°25'	VI-16	0610	12.25	0-71	291.4	2.430
83.60	33°32'	120°45'	VI-16	0225	12.25	0-68	267.2	2.552

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
83.70	33°13'	121°25'	VI-15	2115	12.5	0-72	384.8	1.874
83.80	32°54'	122°07'	VI-15	1545	12.0	0-70	370.5	1.887
83.90	32°36'	122°46'	VI-15	1100	12.25	0-72	375.5	1.920
87.35	33°49'	118°37'	VI-13	2320	12.25	0-66	387.0	1.698
87.40	33°40'	118°58'	VI-14	0240	13.75	0-70	433.4	1.622
86.50			Not occupied					
87.60	33°00'	120°21'	VI-14	1125	12.5	0-70	371.5	1.876
87.70	32°39'	121°03'	VI-14	1720	12.5	0-74	391.8	1.889
87.80	32°20'	121°43'	VI-14	2310	12.5	0-71	378.6	1.870
87.90	32°01'	122°24'	VI-15	0620	12.0	0-72	369.7	1.953
90.30	33°24'	117°55'	VI-13	1745	12.0	0-57	436.6	1.308
90.37	33°11'	118°24'	VI-13	1235	12.25	0-71	376.6	1.875
90.45	32°56'	118°58'	VI-13	0725	12.75	0-71	393.7	1.793
90.53	32°40'	119°30'	VI-13	0215	12.75	0-67	356.7	1.890
90.60	32°22'	120°00'	VI-12	2105	12.25	0-71	351.8	2.030
90.70	32°00'	120°44'	VI-12	1610	13.0	0-74	387.0	1.902
90.80	31°39'	121°21'	VI-12	1030	12.25	0-74	407.8	1.817
90.90	31°20'	122°02'	VI-12	0555	12.5	0-74	407.5	1.821
90.100	31°02'	122°41'	VI-12	0005	12.25	0-73	388.5	1.887
90.110	30°43'	123°21'	VI-11	1850	12.25	0-73	388.9	1.877
90.120	30°24'	124°02'	VI-11	1355	11.75	0-69	392.0	1.758
93.30	32°47'	117°31'	VI-18	0355	12.25	0-68	402.2	1.691
93.40	32°29'	118°13'	VI-18	0850	12.25	0-71	343.3	2.074
93.50	32°10'	118°53'	VI-18	1420	12.5	0-71	400.5	1.770
93.60	31°51'	119°36'	VI-18	1930	12.5	0-84	313.4	2.687
93.70	31°32'	120°16'	VI-19	0050	12.25	0-73	343.1	2.134
93.80	31°13'	120°56'	VI-19	0610	12.25	0-74	356.3	2.091
93.90	30°54'	121°38'	VI-19	1250	12.0	0-69	388.3	1.769
97.32			No tow taken					
97.40	31°56'	117°52'	VI-20	2040	12.25	0-71	317.2	2.226
97.50	31°31'	118°28'	VI-20	1535	12.0	0-68	323.3	2.088
97.60	31°13'	119°09'	VI-20	1225	12.25	0-69	339.2	2.046
97.70	30°54'	119°50'	VI-20	0535	12.25	0-70	368.9	1.884
97.80	30°35'	120°31'	VI-19	2345	12.5	0-70	371.9	1.885
97.90	30°16'	121°12'	VI-19	1750	12.5	0-78	358.1	2.178
P-100.30	31°40.5'	116°46.5'	VI-23	0200	22.25	0-64	854.8	.755
100.40			Not occupied					
100.50			Not occupied					
100.60			Not occupied					
100.70			Not occupied					
100.80			Not occupied					
100.90			Not occupied					
100.100			Not occupied					
100.110			Not occupied					

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
100.120			Not occupied					
105.35	30°39'	116°33'	VI-22	1555	20.25	0-60	493.4	1.214
110.35	29°46.5'	116°00'	VI-22	0655	23.25	0-69	619.8	1.115
110.45			Not occupied					
110.50			Not occupied					
110.60			Not occupied					
110.70			Not occupied					
110.80			Not occupied					
110.90			Not occupied					
110.100			Not occupied					
110.110			Not occupied					
113.35	29°12'	115°39'	VI-22	0020	22.5	0-67	645.9	1.044
117.35	28°37'	115°16'	VI-21	1820	24.5	0-69	484.0	1.434
120.35	28°03'	114°54'	VI-21	1245	21.75	0-68	442.6	1.525
120.45	27°43'	115°33'	VI-21	0700	21.25	0-62	601.5	1.037
120.50	27°33'	115°52.5'	VI-20	1940	19.25	0-59	597.2	.981
120.60	27°13'	116°31.5'	VI-20	1035	22.0	0-62	700.1	.890
120.70			Not occupied					
120.80			Not occupied					
120.90			Not occupied					
120.100			Not occupied					
120.110			Not occupied					
123.40A	27°18'	114°51.5'	VI-12	0920	23.0	0-67	785.6	.850
123.40B	27°18'	114°51.5'	VI-19	2210	22.5	0-64	726.1	.879
123.50	26°58'	115°30.5'	VI-19	1515	22.25	0-66	735.9	.894
123.60	26°38.5'	116°09'	VI-19	0910	22.0	0-68	688.4	.983
127.40	26°43.5'	114°29.5'	VI-18	1140	23.75	0-70	689.7	1.019
127.50	26°23.5'	115°08'	VI-18	1830	22.25	0-69	697.5	.992
127.60	26°03.5'	115°46.5'	VI-19	0025	21.5	0-72	699.2	1.024
130.35	26°22'	113°54'	VI-14	1025	22.5	0-70	725.7	.963
130.40	26°09'	114°07.5'	VI-14	1520	23.0	0-66	680.7	.962
130.50	25°49'	114°46'	VI-14	2325	22.25	0-69	691.4	.998
130.60			Not occupied					
130.70			Not occupied					
130.80			Not occupied					
Cruise 16								
B-40.45	41°33'	125°00'	VII-22	1705	12.25	0-68	320.0	2.140
40.50	41°23'	125°23'	VII-22	1300	13.25	0-69	369.2	1.877
40.60	41°03'	126°09'	VII-22	0450	13.75	0-75	348.0	2.150
40.70	40°42'	126°55'	VII-21	2120	13.5	0-70	356.9	1.956
40.80	40°23'	127°40'	VII-21	1315	23.75	0-72	658.9	1.099
40.90	40°02'	128°25'	VII-21	0550	13.25	0-76	344.2	2.223
40.100	39°42'	129°10'	VII-20	2110	23.75	0-71	653.1	1.096
40.110	39°23'	129°55'	VII-20	1425	23.0	0-72	621.5	1.158

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
43.50	40°48'	124°57'	VII-22	2405	13.5	0-70	293.7	2.370
43.60	40°28'	125°43'	VII-23	0540	12.25	0-77	227.3	3.375
47.55	40°04'	124°55'	VII-23	1650	13.5	0-72	334.1	2.146
47.60	39°54'	125°18'	VII-23	1145	14.0	0-74	310.2	2.395
50.55	39°30'	124°30'	VII-17	1405	12.25	0-69	393.1	1.760
50.60	39°20'	124°52'	VII-17	2000	12.75	0-69	333.0	2.063
50.70	39°00'	125°36.5'	VII-18	0245	13.25	0-69	340.0	2.035
50.80	38°40'	126°21'	VII-18	1000	13.5	0-66	390.5	1.703
50.90	38°20'	127°05'	VII-18	1625	14.75	0-68	397.9	1.699
50.100	38°00'	127°49'	VII-18	2305	24.0	0-70	657.7	1.070
50.110	37°40'	128°33'	VII-19	0605	23.75	0-67	742.9	.900
50.120	37°20'	129°16.5'	VII-19	1235	23.25	0-70	668.8	1.047
50.130	37°00'	130°00'	VII-19	1825	23.0	0-69	726.6	.952
53.54	38°58'	124°00'	VII-17	0735	13.75	0-73	321.7	2.257
53.64	38°38'	124°44'	VII-16	2100	13.5	0-71	392.5	1.819
57.54	38°24'	123°35'	VII-16	0455	23.75	0-72	581.7	1.236
57.64	38°04'	124°19'	VII-16	1125	25.0	0-67	361.3	1.849
60.60	37°37'	123°37'	VII-15	1410	23.75	0-74	486.6	1.511
60.70	37°17'	124°21'	VII-15	0630	24.75	0-77	461.6	1.664
60.80	36°57'	125°04'	VII-14	1920	23.75	0-67	539.8	1.236
60.90	36°37'	125°47'	VII-14	0740	24.5	0-68	609.3	1.108
60.100	36°17'	126°30'	VII-13	2155	24.25	0-68	658.9	1.024
60.110	35°57'	127°12'	VII-13	1450	24.0	0-69	642.7	1.077
60.120	35°37'	127°54.5'	VII-13	0535	22.5	0-68	700.8	.969
60.130	35°17'	128°37'	VII-12	2125	24.0	0-67	710.3	.949
61.55	37°37'	123°07.5'	VII-15	2040	24.5	0-72	699.2	1.023
63.57	37°09'	122°58'	VII-6	2110	24.75	0-68	832.0	.814
63.67	36°49'	123°41'	VII-7	0440	26.75	0-69	790.8	.871
67.55	36°39'	122°26'	VII-9	1305	23.75	0-69	519.8	1.333
67.65	36°19'	123°09'	VII-9	0600	24.5	0-72	537.1	1.348
70.55	36°03'	122°02'	VII-9	2010	24.0	0-72	572.6	1.263
70.60	35°53'	122°23'	VII-10	0050	24.0	0-70	522.1	1.345
70.70	35°33'	123°06'	VII-10	0820	24.0	0-70	591.2	1.182
70.80	35°13'	123°48'	VII-10	1540	24.0	0-72	545.8	1.325
70.90	34°53'	124°30'	VII-10	2340	25.5	0-69	526.4	1.315
70.100	34°33'	125°12'	VII-11	0655	24.0	0-74	577.0	1.279
70.110	34°13'	125°54'	VII-11	1345	24.0	0-72	598.2	1.197
70.120	33°53'	126°35.5'	VII-11	2005	23.5	0-72	563.4	1.274
70.130	33°33'	127°16.5'	VII-12	0225	23.5	0-73	667.2	1.091
C-73.51	35°35.5'	121°20'	VII-8	1030	12.0	0-71	363.7	1.949
73.61	35°15.5'	122°02.5'	VII-8	1455	12.5	0-66	348.8	1.898
77.55	34°54'	121°13'	VII-9	0105	12.75	0-66	233.4	2.807
77.65	34°34'	121°54.8'	VII-8	1955	12.25	0-71	348.2	2.036
80.55	34°18.5'	120°52'	VII-9	0555	12.75	0-70	402.9	1.727

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
80.60	34°08.6'	121°10'	VII-9	0855	12.0	0-67	361.4	1.832
80.70	33°47'	121°52.5'	VII-9	1445	12.25	0-71	317.4	2.234
80.80	33°29.5'	122°32.5'	VII-9	1930	12.25	0-72	364.6	1.980
80.90	33°10'	123°13.5'	VII-10	0050	12.0	0-69	355.7	1.934
80.100	32°49.5'	123°54.5'	VII-10	0550	12.5	0-72	374.5	1.923
80.110	32°29.5'	124°35.5'	VII-10	1100	12.0	0-69	359.6	1.930
80.120	32°11.5'	125°16'	VII-10	1605	12.25	0-70	375.9	1.862
80.130	31°49'	125°56'	VII-10	2120	12.0	0-72	379.4	1.900
83.55	33°45'	120°26'	VII-16	0350	12.75	0-66	425.6	1.541
83.60	33°38'	120°40.2'	VII-16	0040	12.75	0-66	358.9	1.842
83.70	33°17.6'	121°21'	VII-15	1945	12.25	0-65	388.3	1.679
83.80	32°56'	122°05.8'	VII-15	1440	12.5	0-68	392.6	1.732
83.90	32°35.5'	122°47'	VII-15	0920	12.0	0-71	370.1	1.913
86.50	33°26.5'	119°44.5'	VII-14	0720	6.5	0-69	178.7	3.861
87.35	33°50'	118°37.5'	VII-13	2245	12.25	0-67	336.4	2.004
87.40	33°41'	118°59'	VII-14	0150	14.0	0-73	364.6	2.002
87.60	33°01'	120°21.7'	VII-14	1155	12.25	0-71	300.9	2.373
87.70	32°41'	121°02'	VII-14	1650	12.25	0-67	400.7	1.669
87.80	32°20'	121°43'	VII-14	2200	13.25	0-73	380.6	1.908
87.90	32°01'	122°23'	VII-15	0310	12.5	0-72	367.8	1.949
90.30	33°24'	117°55'	VII-13	1705	13.0	0-61	388.3	1.576
90.37	33°11'	118°23.6'	VII-13	1245	12.25	0-67	330.4	2.034
90.45	32°54'	118°56'	VII-13	0820	12.75	0-69	330.1	2.090
90.53	32°38.5'	119°29'	VII-13	0310	12.75	0-70	344.8	2.024
90.60	32°24.5'	119°56.5'	VII-12	2155	13.25	0-83	277.2	2.980
90.70	32°06.5'	120°39'	VII-12	1612	12.5	0-74	306.2	2.407
90.80	31°45.5'	121°22'	VII-12	1040	22.25	0-74	531.7	1.392
90.90	31°28'	120°00.5'	VII-12	0445	23.0	0-72	557.7	1.282
90.100	31°05.8'	122°41'	VII-11	2315	22.5	0-69	683.9	1.013
90.110	30°45.5'	123°26'	VII-11	1720	12.5	0-72	356.3	2.010
90.120	32°24.5'	124°04.5'	VII-11	1110	12.0	0-72	362.0	1.989
93.30	32°51.5'	117°32'	VII-17	0900	12.5	0-68	405.7	1.676
93.40	32°30'	118°12.5'	VII-17	1440	22.25	0-69	697.8	.990
93.50	32°10.5'	118°54'	VII-17	2050	22.5	0-67	680.7	.986
93.60	31°51.5'	119°32'	VII-18	0930	22.25	0-68	686.5	.988
93.70	31°30.5'	120°13.5'	VII-18	1505	22.75	0-68	680.3	.992
93.80	31°11'	120°54'	VII-18	2125	22.5	0-71	677.4	1.044
93.90	30°50.5'	121°35'	VII-19	0235	22.25	0-70	679.5	1.027
97.32	32°13'	117°17.5'	VII-21	0040	23.75	0-70	694.3	1.010
97.40	31°55.5'	117°50'	VII-20	1940	22.75	0-73	686.5	1.059
97.50	31°31.5'	118°26'	VII-20	1125	12.0	0-71	381.3	1.854
97.60	31°15.5'	119°11'	VII-20	0335	12.5	0-71	402.4	1.757
97.70	30°55'	119°49.5'	VII-19	2205	22.25	0-69	668.6	1.032
97.80	30°36'	120°31'	VII-19	1455	22.25	0-69	718.0	.965
97.90	30°15'	121°11'	VII-19	0840	22.75	0-69	713.6	.961

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. Long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
P-100.30	31°40.5'	116°46.5'	VII-20	0105	23.0	0-69	805.1	.862
100.40	31°22'	117°32'	VII-19	1900	23.5	0-69	761.8	.903
100.50	31°05'	118°14'	VII-19	1115	23.0	0-67	767.2	.877
100.60	30°43'	118°53'	VII-19	0555	22.5	0-70	732.0	.949
100.70	30°21'	119°32'	VII-19	0025	23.0	0-68	709.2	.962
100.80	30°00'	120°09'	VII-18	1855	23.0	0-67	760.7	.883
100.90	29°35'	120°47'	VII-18	1320	23.5	0-65	764.2	.856
100.100	29°16'	121°28'	VII-18	0805	23.0	0-68	753.5	.898
100.110	28°57'	122°09'	VII-18	0230	23.5	0-67	700.7	.956
100.120	28°39'	122°49'	VII-17	2050	22.5	0-66	815.8	.815
105.35	30°09'	116°33'	VII-7	0700	22.25	0-59	825.7	.711
110.35	29°50'	116°02'	VII-15	0705	23.0	0-69	710.8	.967
110.40	29°40'	116°22'	VII-15	1035	23.0	0-70	734.5	.950
110.50	29°20'	117°00'	VII-15	1655	22.0	0-66	730.4	.901
110.60	28°59'	117°41'	VII-15	2250	23.0	0-70	758.4	.919
110.70	28°39'	118°20'	VII-16	0440	22.5	0-68	739.5	.918
110.80	28°19'	118°58'	VII-16	1035	23.0	0-68	768.3	.888
110.90	28°01'	119°34'	VII-16	1635	22.5	0-68	788.4	.864
110.100	27°37'	120°16'	VII-16	2250	23.0	0-70	731.3	.963
110.110	27°16.5'	120°54.5'	VII-17	0450	23.0	0-68	780.2	.865
113.35	29°12'	115°39'	VII-15	0010	23.0	0-67	809.5	.828
117.35	28°37'	115°16'	VII-14	1735	22.0	0-71	711.0	.997
120.35	28°03'	114°54'	VII-14	1035	23.0	0-65	591.2	1.096
120.45	27°43'	115°33'	VII-14	0435	23.0	0-70	719.0	.972
120.50	27°33'	115°52.5'	VII-14	0020	22.5	0-70	(724.3)	.964
120.60	27°13'	116°31.5'	VII-13	1735	24.0	0-67	776.8	.857
120.70	26°54'	117°10'	VII-13	1105	23.0	0-69	745.3	.930
120.80	26°37'	117°50'	VII-13	0350	23.0	0-68	828.3	.827
120.90	26°19'	118°35'	VII-12	2020	23.0	0-68	772.8	.884
120.100	26°02'	119°10'	VII-12	1340	23.0	0-70	755.3	.929
120.110	25°45'	119°43'	VII-12	0810	23.0	0-72	728.1	.986
123.40	27°16'	114°49'	VII-8	1320	24.0	0-67	847.1	.790
123.50	26°58'	115°32'	VII-8	1940	24.0	0-69	785.2	.879
123.60	26°36'	116°06'	VII-9	0315	23.0	0-69	763.5	.902
127.40	26°43.5'	114°29.5'	VII-10	0015	24.0	0-69	744.0	.923
127.50	26°23.5'	115°08'	VII-9	1645	24.0	0-68	722.4	.937
127.60	25°55'	115°42'	VII-9	0830	24.5	0-67	836.6	.798
130.35	26°17'	113°55'	VII-10	0605	24.0	0-68	789.7	.862
130.40	26°07'	114°11'	VII-10	0925	23.0	0-70	739.7	.946
130.50	25°50'	114°46'	VII-10	1510	23.0	0-70	747.6	.930
130.60	25°29'	115°24'	VII-10	2145	23.0	0-70	668.6	1.054
130.70	25°04'	116°10'	VII-11	0430	23.0	0-64	795.2	.809
130.80	24°47'	116°48'	VII-11	1015	24.0	0-71	713.9	.996

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-13 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
Cruise 17								
B-20.10	46°10.5'	124°49'	VIII-18	2035	12.5	0-66	418.7	1.564
20.20	45°50.5'	125°38.5'	VIII-18	1400	12.0	0-63	439.2	1.435
20.30	45°30.5'	126°27.5'	VIII-18	0715	23.0	0-66	792.7	.833
20.40	45°10.5'	127°16.5'	VIII-18	0130	13.0	0-67	447.3	1.496
20.50	44°50.5'	128°06'	VIII-17	1930	20.0	0-68	651.9	1.042
20.60	44°30.5'	128°53.5'	VIII-17	1310	12.5	0-65	434.1	1.506
20.70	44°10.5'	129°42.5'	VIII-17	0630	12.25	0-63	434.9	1.442
20.80	43°50.5'	130°30'	VIII-17	0145	12.5	0-70	435.2	1.611
20.90	43°30.5'	131°18'	VIII-16	1520	12.75	0-67	434.5	1.544
23.15	45°25.5'	124°47'	VIII-19	0400	13.25	0-70	421.0	1.668
27.20	44°40'	124°45'	VIII-19	1120	12.75	0-68	467.0	1.450
30.26	43°54.5'	124°49.5'	VIII-13	1425	12.75	0-60	435.9	1.383
30.30	43°46.5'	125°08.5'	VIII-13	1700	12.25	0-56	378.5	1.477
30.40	43°26.5'	125°56'	VIII-13	2350	12.75	0-68	400.1	1.710
30.50	43°06.5'	126°43.5'	VIII-14	0730	13.0	0-71	331.5	2.154
30.60	42°46.5'	127°30.5'	VIII-14	1825	15.0	0-63	541.9	1.170
30.70	42°26.5'	128°17'	VIII-15	0010	13.5	0-68	479.4	1.425
30.80	42°06.5'	129°04'	VIII-15	0800	12.75	0-65	500.2	1.303
30.90	41°47'	129°50'	VIII-15	1455	23.0	0-66	806.6	.823
30.100	41°27'	130°36'	VIII-15	2135	13.25	0-67	466.9	1.429
33.32	43°07.5'	124°53'	VIII-13	0735	13.5	0-69	337.9	2.033
37.38	42°20'	124°56.5'	VIII-12	2335	13.75	0-67	338.1	1.982
40.45	41°33'	125°00'	VIII-12	1555	17.75	0-94	539.7	1.751
40.50	41°23'	125°23'	VIII-12	1125	13.0	0-73	317.4	2.313
40.60	41°03'	126°09'	VIII-12	0125	13.75	0-71	413.2	1.709
40.70	40°42'	126°55'	VIII-11	1840	12.0	0-71	396.5	1.796
40.80	40°23'	127°40'	VIII-11	1215	12.5	0-73	399.0	1.829
40.90	40°02'	128°25'	VIII-11	0525	12.5	0-66	410.8	1.607
40.100	39°42'	129°10'	VIII-10	2145	23.75	0-70	774.7	.907
40.110	39°23'	129°55'	VIII-10	1550	11.75	0-68	413.4	1.655
40.120	39°03'	130°39'	VIII-10	0730	12.5	0-67	443.9	1.500
43.50	40°48'	124°57'	VIII-6	1950	12.75	0-63	246.9	2.742
43.60	40°28'	125°43'	VIII-7	0340	12.25	0-69	427.8	1.620
47.55	40°04'	124°55'	VIII-6	1145	12.25	0-64	369.1	1.729
47.60	39°54'	125°18'	VIII-7	1020	12.25	0-70	361.8	1.946
50.55	39°30'	124°30'	VIII-6	0135	13.5	0-73	406.9	1.787
50.60	39°20'	124°52'	VIII-7	1655	12.0	0-69	419.4	1.650
50.70	39°00'	125°36.5'	VIII-8	0020	13.25	0-67	435.7	1.533
50.80	38°40'	126°21'	VIII-8	0630	12.0	0-63	461.4	1.365
50.90	38°20'	127°05'	VIII-8	1255	12.0	0-67	378.3	1.782
50.100	38°00'	127°49'	VIII-8	1840	12.5	0-66	407.6	1.619
50.110	37°40'	128°33'	VIII-9	0120	12.5	0-69	434.0	1.599
50.120	37°20'	129°16.5'	VIII-9	0710	12.25	0-64	461.9	1.381
50.130	37°00'	130°00'	VIII-9	1415	12.5	0-70	405.9	1.724

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
P-70.80-1	35°12'	123°47'	VIII-9	1420	26.25	0-147	711.5	2.061
70.80-2	35°12'	123°47'	VIII-9	2100	26.0	0-146	737.7	1.974
70.80-3	35°12'	123°47'	VIII-10	1520	25.5	0-139	735.3	1.996
83.60	33°34'	120°49'	VIII-12	0920	22.0	0-64	629.7	1.021
83.70	33°14.5'	121°26'	VIII-12	1535	25.0	0-72	709.9	1.010
87.60	33°00'	120°21.5'	VIII-13	0520	23.5	0-67	732.8	.917
87.70	32°39.5'	121°02'	VIII-12	2230	24.25	0-69	774.7	.892
86.50	33°28'	119°46'	VIII-13	1055	24.75	0-70	602.8	1.166
Cruise 18								
B-30.26	43°54.5'	124°49.5'	IX-19	1315	24.25	0-71	675.7	1.046
30.30	43°46.5'	125°08.5'	IX-19	0950	13.75	0-66	466.1	1.416
30.40	43°26.5'	125°56'	IX-19	0315	13.75	0-68	432.1	1.576
30.50	43°06.5'	126°43.5'	IX-18	1910	14.5	0-71	399.6	1.784
30.60	42°46.5'	127°30.5'	IX-13	1255	24.25	0-71	642.1	1.106
30.70	42°26.5'	128°17'	IX-18	0540	24.25	0-72	455.6	1.587
30.80	42°06.5'	129°04'	IX-17	2125	24.25	0-61	799.3	.766
30.90	41°47'	129°50'	IX-17	1400	25.5	0-72	734.5	.976
30.100	41°27'	130°36'	IX-17	0500	24.5	0-68	732.0	.930
33.32	43°07.5'	124°53'	IX-19	1930	13.75	0-70	470.5	1.483
37.38	42°20'	124°56.5'	IX-20	0455	13.25	0-68	452.0	1.500
40.45	41°33'	125°00'	IX-13	1935	15.75	0-68	385.9	1.757
40.50	41°23'	125°23'	IX-13	2325	14.25	0-67	399.3	1.673
40.60	41°03'	126°09'	IX-14	0620	13.75	0-63	371.4	1.702
40.70	40°42'	126°55'	IX-14	1400	13.5	0-71	334.6	2.131
40.80	40°23'	127°40'	IX-14	2030	13.25	0-68	371.0	1.844
40.90	40°02'	128°25'	IX-15	0325	24.5	0-70	722.2	.966
40.100	39°42'	129°10'	IX-15	1215	13.75	0-73	362.7	2.007
40.110	39°23'	129°55'	IX-15	1750	24.0	0-72	666.2	1.088
40.120	39°03'	130°39'	IX-16	0220	24.75	0-71	728.8	.969
43.50	40°48'	124°57'	IX-13	1220	14.75	0-70	393.6	1.789
43.60	40°28'	125°43'	IX-13	0525	15.25	0-68	396.5	1.702
47.55	40°04'	124°55'	IX-12	1810	13.25	0-67	350.3	1.958
47.60	39°54'	125°18'	IX-12	2230	14.0	0-68	367.6	1.861
50.55	39°30'	124°30'	IX-12	1130	13.0	0-67	226.3	2.978
50.60	39°20'	124°52'	IX-12	0720	13.75	0-68	347.4	1.972
50.70	39°00'	125°36.5'	IX-12	0035	13.25	0-70	338.0	2.071
50.80	38°40'	126°21'	IX-11	1655	23.5	0-69	651.6	1.060
50.90	38°20'	127°05'	IX-11	0940	23.75	0-71	646.1	1.093
50.100	38°00'	127°49'	IX-11	0210	24.25	0-71	612.8	1.155
50.110	37°40'	128°33'	IX-10	1825	23.25	0-69	658.6	1.049
50.120	37°20'	129°16.5'	IX-10	1105	23.5	0-69	568.9	1.220
50.130	37°00'	130°00'	IX-10	0255	23.75	0-73	460.3	1.582
53.54	38°58'	124°00'	IX-6	1235	14.25	0-65	413.6	1.579
53.64	38°38'	124°44'	IX-6	1855	14.75	0-70	415.1	1.677

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
57.54	38°24'	123°35'	IX-6	0625	14.0	0-73	419.3	1.739
57.64	38°04'	124°19'	IX-7	0125	12.5	0-67	416.7	1.613
60.60	37°37'	123°37'	IX-7	0840	13.25	0-69	405.4	1.712
60.70	37°17'	124°21'	IX-7	1505	12.75	0-72	355.8	2.032
60.80	36°57'	125°04'	IX-7	2115	13.75	0-68	400.3	1.694
60.90	36°37'	125°47'	IX-8	0435	13.5	0-67	365.1	1.827
60.100	36°17'	126°30'	IX-8	1140	13.5	0-69	377.3	1.823
60.110	35°57'	127°12'	IX-8	1820	12.75	0-70	368.3	1.909
60.120	35°37'	127°54.5'	IX-9	0040	24.0	0-74	602.7	1.229
60.130	35°17'	128°37'	IX-9	0735	23.75	0-68	465.0	1.467
61.55	37°37'	123°07.5'	IX-5	1750	16.25	0-70	514.6	1.358
C-70.55	36°03.4'	122°01.7'	IX-6	2220	14.0	Non quantitative		
70.60	35°53'	122°23'	IX-7	0155	14.5	0-69	442.3	1.569
70.70	35°35'	123°05.5'	IX-7	0815	13.25	0-70	409.0	1.719
70.80	35°16.5'	123°48'	IX-7	1530	12.5	0-70	358.5	1.958
70.90	34°57.3'	124°31'	IX-7	2055	13.0	0-70	380.7	1.847
70.100	34°38.8'	125°13.5'	IX-8	0220	12.75	0-73	366.2	1.994
70.110	34°20'	125°55.5'	IX-8	0910	12.5	0-72	354.1	2.039
70.120	34°01'	126°37.8'	IX-8	1330	12.5	0-70	379.8	1.843
70.130	33°33'	127°16.5'	IX-8	1820	22.75	0-72	669.5	1.072
90.30	33°24	117°54.8'	IX-18	1955	22.75	0-71	650.8	1.089
90.37	33°10.9'	118°23.2'	IX-18	1330	21.75	0-71	652.3	1.091
90.45	32°56.8'	118°55.5'	IX-18	1025	23.0	0-71	519.8	1.358
90.53	32°39.6'	119°29'	IX-18	0610	23.25	0-69	620.4	1.115
90.60	32°30.6'	119°54.3'	IX-18	0220	23.25	0-69	685.5	1.005
90.70	32°11'	120°36.2'	IX-17	2055	22.5	0-69	705.3	.974
90.80	31°48.7'	121°18'	IX-17	1510	23.0	0-68	723.8	.944
90.90	31°25'	122°01'	IX-17	0930	22.5	0-68	692.1	.990
90.100	31°04.5'	122°40'	IX-17	0330	22.75	0-69	722.3	.953
90.110	30°44.5'	123°20'	IX-16	2200	22.5	0-69	729.5	.951
90.120	30°23.7'	124°01'	IX-16	1610	22.75	0-69	702.6	.988
P-100.30	31°40.5'	116°46.5'	IX-21	2105	23.5	0-67	820.4	.812
100.40	31°24'	117°20'	IX-21	1525	23.25	0-66	806.5	.822
100.50	31°07'	117°53'	IX-21	1015	23.75	0-67	(748.7)	.898
100.60	30°49'	118°31'	IX-21	0350	23.75	0-70	652.3	1.072
100.70	30°20.5'	119°27'	IX-20	1955	23.75	0-67	740.1	.904
100.80	30°00'	120°09'	IX-20	1320	23.25	0-69	642.8	1.078
100.90	29°37'	120°52'	IX-20	0545	24.0	0-67	729.6	.922
100.100	29°15'	121°37'	IX-19	2140	23.5	0-71	713.2	1.001
100.110	29°00.5'	122°07'	IX-19	1520	23.75	0-68	776.3	.877
105.35	30°39'	116°33'	IX-7	0215	22.25	0-60	824.3	.724
110.35	29°46.5'	116°00'	IX-16	2335	23.75	0-64	808.7	.791
110.40	29°36.5'	116°19.5'	IX-17	0620	23.25	0-64	760.5	.846

Table I (cont'd)

Record of Oblique Hauls made with Plankton Nets during Cruises 11-18 in 1950

Station	Position N. lat.	Position W. long.	Date	Hour	Duration of Haul	Depth Meters	Vol. of Water Strained	S Factor
110.50	29°19'	117°02'	IX-17	0910	24.0	0-65	802.9	.806
110.60	28°59'	117°41'	IX-17	1520	25.0	0-66	806.3	.820
110.70	28°36'	118°18'	IX-17	2120	24.0	0-68	773.2	.873
110.80	28°20'	118°58'	IX-18	0405	24.0	0-66	666.0	.996
110.90	28°04'	119°42'	IX-18	1010	23.75	0-67	772.6	.863
110.100	27°40'	120°18'	IX-18	1635	23.5	0-66	755.4	.871
110.110	27°16.5'	120°54.5'	IX-18	2245	23.75	0-68	656.8	1.031
113.35	29°12'	115°39'	IX-16	1645	23.5	0-64	833.1	.768
117.35	28°37'	115°16'	IX-16	0955	23.75	0-64	786.0	.813
120.27	29°19'	114°23'	IX-15	2355	24.0	0-66	753.2	.880
120.35	28°03'	114°54'	IX-15	1955	24.75	0-64	680.6	.939
120.45	27°43'	115°32'	IX-15	1310	23.25	0-67	757.3	.889
120.50	27°21'	116°10'	IX-15	0620	23.5	0-67	754.9	.886
120.60	27°05'	116°43'	IX-14	2400	24.0	0-65	764.0	.851
120.70	26°50'	117°15'	IX-14	1745	23.25	0-62	808.4	.773
120.80	26°34'	117°50'	IX-14	1130	24.5	0-67	842.0	.793
120.90	26°12'	118°30'	IX-14	0450	24.0	0-66	773.8	.857
120.100	25°51'	119°10'	IX-13	2215	23.5	0-68	779.6	.867
120.110	25°32'	119°45'	IX-13	1610	23.5	0-63	802.3	.788
123.40	27°15'	114°54'	IX-8	0635	24.0	0-65	753.2	.864
123.50	26°57'	115°30'	IX-8	1230	24.0	0-65	710.1	.914
123.60	26°38.5'	116°09'	IX-8	1905	14.0	0-72	(402.9)	1.775
127.40	26°43.5'	114°29.5'	IX-9	1410	13.0	0-69	395.6	1.744
127.50			Not occupied					
127.60	26°03.5'	115°46.5'	IX-9	0045	13.0	0-62	406.2	1.529
130.35	26°19'	113°48.5'	IX-11	1310	25.5	0-76	609.7	1.245
130.40	26°07'	114°11'	IX-11	1700	24.0	0-63	825.6	.761
130.50	25°47'	114°55'	IX-11	2300	25.0	0-65	763.2	.846
130.60	25°27'	115°34'	IX-12	0530	23.25	0-63	704.2	.900
130.70	25°08'	116°06'	IX-12	1110	24.75	0-63	826.8	.761
130.80	24°48.5'	116°40'	IX-12	1645	12.75	0-58	452.2	1.283

Table II
Record of Pilchard Eggs, 1950

Station	Number of Normal Eggs A	B	C	D	Total Number of Eggs A	B	C	D	Uncl.	n	Ave. n'
Cruise 11:											
120.35	317	143	179		379*	164*	209*		6	758	253
120.45	15	12	12		113	40*	58*	2	147	360	83
120.50	1	13	21		1	33*	32*		6	72	36
130.35	1	1			1*	1*	1*			3	1
Total	334	169	212		494	238	300	2	159	1193	373
Cruise 12:											
113.35			2		*	*	2*	2*		4	1
117.35		1	1		*	1*	1*			2	1
120.35		2	9			2*	29*			31	16
120.45		2	54			4*	263*	2		269	134
120.90						*	8*			8	4
123.40		10	21			115*	55*		5	175	87
123.50	2				2	*	*			2	1
130.35	284	932	1072		1235*	1335*	2102		711	5383	1480
130.40					*	5*			8	13	6
Total	286	947	1159		1237	1462	2460	4	724	5887	1730
Cruise 13:											
87.35		2	2	2	2*	6*	8*			16	5
90.60				4	*	*	*	4		4	0
93.30			28		*	*	32*			32	11
93.50	23	5	50		45*	8*	68*			121	40
97.32	23	17	166		83*	23*	214*			320	107
97.40	3	12		2	9	32*	8*	2	6	57	22
100.30	4	15	48	15	4	26*	59*	30*	7	126	41
100.40		61	5		*	71*	5			76	36
100.50	244	201	588		315*	220*	613*			1148	383
105.35		1	5	159		1*	5*	265		271	3
110.35		91	104	667	*	134*	145*	1463*		1742	436
113.35	2	4		1	4*	12*	*	1		17	5
117.35		12			2	24*	*		1	27	13
120.45		165	9			366*	34*		11	411	206
120.50			1			3*	12*			15	8
123.40	1182	1521	3797	262	1767	2068*	5860*	1306*	3356	14357	4018
123.50	285	372	944		832*	580*	1502		25	2939	712
123.60					*	*	2*			2	1
127.40		6	5		*	6*	6			12	3
127.50		18	39			28*	74*			102	51
130.35	1077	85	19		2042*	137*	58			2237	1090
130.40	66	2843	52		94	3464*	68			3626	3464
Total	2909	5431	5862	1112	5199	7209	8773	3071	3406	27658	10655

Table II (cont'd)
Record of Pilchard Eggs, 1950

Station	Number of Normal Eggs A	B	C	D	Total Number of Eggs A	B	C	D	Uncl.	n	Ave. n'
Cruise 14:											
83.60			41			*	68*	*		68	23
90.60	2				4*	*	*			4	1
93.40		47	320			83*	614*	10	8	715	352
93.50						*	*	1		1	0
93.60		4		7	*	15*	*	26		41	5
93.70	1	4	16		1*	4*	20*			25	8
97.50					*	*	*	5		5	0
97.80	2	3			5*	8*			2	15	8
97.90			35		*	*	110			110	0
100.40			2		*	*	2			2	0
105.35						2*	*		2	4	2
110.35		23	10	7	1*	89*	13*	13*	33	149	37
113.35				4		*	*	5*		5	2
117.35				1	*	*	*	1		1	0
120.35	14	25	11		48*	37*	17		9	111	46
120.45		752	1110		*	1248*	2310*		360	3918	1306
123.40	5	129	8	5	27	510*	21*	11*	44	613	195
130.35		94	104		*	99*	106			205	50
130.40		2	57		*	33*	113		1	147	17
Total	24	1083	1714	24	86	2128	3394	72	459	6139	2052
Cruise 15:											
60.70		3		3	*	3*	*	3	3	9	2
60.80			4			*	4*	*		4	1
60.90		4			*	4*	*			4	2
70.70			2			*	2*	*		2	1
70.90		6			*	6*	*	*		6	2
77.65	189	32			297*	44*	*		12	353	118
80.55			25	4		*	27*	4*	2	33	11
80.60	25	9	30		37*	16*	30*			83	28
80.80			4		*	*	4			4	0
87.60	164	664	374	85	378*	1023*	679*	724	2476	5280	1306
90.53	2	36	15		2	40*	15*			57	28
90.60			4			*	4*	*		4	1
93.40		10	23			*	14*	41*	2	57	28
93.50			12			*	7*	181	11	199	8
93.60			16			*	*	16*		16	5
117.35					1*	3*	*		34	38	13
120.45			1			*	*	1*		1	0
123.40						*	*	1*	*	1	0
123.50		1	2			3*	4*	44	1	52	4
130.35	3	55				5*	141*	*	2	9	157	52
Total	383	820	512	92	723	1305	1049	733	2550	6360	1610

Table II (cont'd)
Record of Pilchard Eggs, 1950.

Station	Number of Normal Eggs A	B	C	D	Total Number of Eggs A	B	C	D	Uncl.	n	Ave. n'
Cruise 16:											
70.55		2				2*	*			2	1
90.37	22				22*	*				22	11
120.35		287			*	306*				306	153
120.45		60				72*				72	72
120.50		1				1*	*			1	1
Total	22	350			22	381				403	238
Cruise 17:											
50.55			3			*	3*	*		3	1
Total			3				3			3	1
Cruise 18:											
130.35		2			20*	37			2	59	21
Total		2			20	37			2	59	21

Table III
Record of Pilchard Larvae, 1950

Station	Midpoint of Size Class (in mm.)																	
	3.25	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	Dis.	Total
Cruise 11:																		
120,35		2.6																2.6
120.45	1.8	5.5	3.7	5.5	11.9	3.6	0.9	0.9									1.8	35.6
120.50	34.4	121.0	7.8	27.7	28.9	14.4	26.6	8.9	2.2		1.1							273.0
127.50												1.4						1.4
130.35	1.2																	1.2
130.60			11.5	16.2	3.9	1.6			1.5									34.7
Total	37.4	129.1	23.0	49.4	44.7	19.6	27.5	9.8	3.7		1.1	1.4					1.8	348.5
Cruise 12:																		
87.35		0.8																0.8
110.40								5.5	1.1	1.1	1.1							8.8
110.50																	1.0	1.0
117.35							1.0										9.5	10.5
120.35	7.3	41.0	26.4	16.4	16.4	11.0	4.6	4.5	2.7									130.3
120.45	3.2	9.5	5.5		0.8	0.8	1.6	0.8										22.2
120.50				0.6														0.6
120.90	2.0																	2.0
123.40	9.9	16.9	1.0	1.0	2.0	2.0	1.0											33.8
127.40											0.9							0.9
130.35	43.3	63.9	3.8	1.9														112.9
130.40										0.9								0.9
130.50												1.0						1.0
130.60			0.8															0.8
130.80							0.9											0.9
Total	65.7	132.1	37.5	19.9	19.2	13.8	9.1	10.8	3.8	2.0	2.0	1.0					10.5	327.4

Table III (cont'd)
Record of Pilchard Larvae, 1950

Station	Midpoint of Size Class (in mm.)																
	3.25	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	Dis.	Total
Cruise 13:																		
97.32		14.3																14.3
97.40	21.3	45.6	10.7	3.0		1.5					3.0							85.1
100.30	3.7	14.8	3.7															22.2
100.50	2.2	4.4																6.6
105.35	10.6																	10.6
110.35	8.1																	8.1
117.35						2.2		2.2	1.1	2.2								7.7
120.35	27.9	71.6																99.5
120.45	12.9	2.1	8.5		8.6	4.2	8.5	2.1	4.3	2.1								53.3
120.50		2.0																2.0
123.40	99.5	153.7	43.0	15.8	18.1	11.3	4.5	2.3		2.3		2.3			2.3		38.4	393.5
123.50	151.8	68.6	8.3	2.1		2.1	2.1											235.0
127.40	9.4	1.0																10.4
127.50	22.6	54.8	20.3	14.3	14.2	13.1	14.3	17.8	11.9	1.2								184.5
127.60			1.1	1.1		2.2												4.4
130.35	112.3	343.2	81.1	54.0	35.4	6.3	10.4	2.1	4.2		4.2	4.2						657.4
130.40	47.2	148.0	51.1	9.2	3.9	2.6	2.6	3.9	1.3	1.3	1.3						1.3	273.7
130.50							4.0	7.9	5.0	1.0								17.9
Total	529.5	924.1	227.8	99.5	80.2	45.5	46.4	38.3	27.8	10.1	8.5	6.5			2.3		39.7	2086.2

Table III (cont'd)
Record of Pilchard Larvae, 1950

Station	Midpoint of Size Class (in mm.)																Dis.	Total
	3.25	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25		
Cruise 14:																		22.8
90.53	17.1	5.7															5.2	182.0
93.40	143.0	23.4	7.8		2.6													25.8
93.50	14.9	10.9																58.9
93.60	11.0	47.9																49.7
93.70	35.5	12.8	1.4															12.8
93.80	3.2	6.4	1.6	1.6														252.8
97.40	80.0	142.4	12.8	9.6	1.6	6.4												183.8
97.50	50.3	105.8	17.6	10.1														4.0
97.60		1.6	0.8	0.8	0.8													91.8
97.70		17.5	13.6	15.6	9.7	3.9	2.0			2.0	4.0	7.8	5.8	9.9				4.7
97.80						1.2		3.5										7.5
97.90	7.5									2.5								2.5
100.40													1.3				1.3	42.6
100.50		6.7	16.0	6.7	5.3	2.7	1.3	1.3										61.2
100.60				3.4	7.9	12.6	5.7	3.4	3.4	4.5	2.2	3.4	1.1	8.0	2.2	3.4		2.2
100.70							2.2											2.4
100.90						1.2	1.2											60.8
100.100		2.6	14.1	5.2	2.6	7.8	9.0	7.8	6.5	5.2							1.1	6.6
100.110		1.1			1.1	2.2	1.1											10.5
105.35			7.0								3.5							12.1
113.35	1.2		1.2	1.2		1.2	1.2	1.2	1.2		3.7							3.0
120.35	1.5	1.5															6.2	301.4
120.45	172.2	123.0																1529.3
123.40	1122.1	355.8	30.6	9.6	4.8	3.2		1.6		1.6								8.0
123.50	4.0	4.0																11.8
127.40				1.1	6.4	4.3												924.4
127.50	1.3	49.9	241.9	300.8	192.0	44.8	15.4	12.8	10.2	7.7	10.2	6.4	5.2	10.3	11.6	3.9		
130.35	1.4	18.5	29.8	41.2	32.6	25.6	15.7	8.5	1.4	1.4			1.4	1.4			1.4	180.3
130.40	63.2	81.7	26.1	21.8	9.8	26.1	27.3	16.3	21.8	16.3	9.8	3.3	2.2	3.3		1.1		330.1
130.50																	18.7	18.7
130.60									1.0		2.0							3.0
Total	1729.4	1019.2	422.3	428.7	277.2	143.2	82.1	56.4	45.5	41.2	35.4	20.9	17.0	32.9	13.8	8.4	33.9	4407.5

Table III (cont'd)
Record of Pilchard Larvae, 1950

Station	Midpoint of Size Class (in mm.)																	
	3.25	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	Dis.	Total
Cruise 15:																		
60.70	3.2																	3.2
60.110		1.9	1.9															3.8
70.110		3.1						1.0										4.1
77.65										4.0								4.0
80.55							1.8											1.8
80.60												2.3						2.3
80.70								1.7		5.1	1.7	1.7						10.2
80.80				3.5						3.5	7.0							14.0
83.60															2.6			2.6
87.60	18.8																	18.8
87.80		1.9		1.9	3.7				3.8	1.9								13.2
90.53	1.9	1.9	1.9															5.7
90.60	4.1	32.5	101.5	64.9	60.9	28.4	24.4	4.1	4.1						4.1			329.0
90.70				5.7	1.9	1.9	3.8				1.9							15.2
93.40	16.5	31.0	2.1						2.1									51.7
93.50	42.4		1.8															44.2
93.60	37.7	26.9	70.0	53.8	21.5			5.4									5.4	220.7
93.70		6.4	4.2	4.2	27.7	53.3	51.2	29.9	29.8	12.8	6.4			14.9	4.3			245.1
93.80		4.2			12.6	6.3	4.2		2.1	2.1								31.5
97.40										4.4	4.4	2.2						11.0
97.50		10.5	2.1	2.1	2.1	2.1												18.9
97.60	12.2	28.8	14.3	6.2	6.2	16.4	2.0	4.1	2.0									92.2
97.70		9.4	33.8	56.4	30.1	24.4	1.9	1.9										157.9
97.80										1.9				1.9		1.9		5.7
100.30														0.8	0.8			1.6
120.50			1.0						1.0		1.0							3.0
123.50		0.9		0.9											0.9			2.7
127.40		1.0																1.0
130.35	1.0	1.0																2.0
130.50														1.0				1.0
Total	137.8	161.4	234.6	199.6	166.7	132.8	89.3	48.1	44.9	35.7	22.4	6.2		18.6	12.7	1.9	5.4	1318.1

Table III (cont'd)
Record of Pilchard Larvae, 1950

Station	Midpoint of Size Class (in mm.)																
	3.25	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	Dis. Total
Cruise 16:																	
61.55												2.0					2.0
70.80													1.3	1.3			2.6
70.90										5.3							5.3
73.51	3.9																3.9
77.65				2.0		2.0	2.0										6.0
87.40											2.0		2.0	4.0			8.0
87.80															3.8		3.8
90.80																1.4	1.4
93.50														1.0	4.0		5.0
93.80		2.9														1.0	1.0
100.60	2.0																2.9
120.45																	2.0
120.50		7.1	7.1		3.6	1.8				1.8	1.8			1.0	1.0		2.0
123.50																	23.2
Total	5.9	10.0	7.1	2.0	3.6	3.8	2.0			7.1	3.8	2.0	3.3	7.3	8.8	2.4	69.1
Cruise 17:																	
67.55		2.1	2.1	1.1	5.3			1.1									11.7
73.51																3.1*	3.1
Total		2.1	2.1	1.1	5.3			1.1								3.1	14.8
Cruise 18:																	
120.27									0.9	1.8							2.7
120.35								1.9									1.9
130.35	11.2																11.2
Total	11.2							1.9	0.9	1.8							15.8

* Represents one 31.5 mm. larva

Table IV
Record of Anchovy Larvae, 1950

Station	Midpoint of Size Class (in mm.)																	
	3.0	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.75	Dis.	Total
Cruise 11:																			
80.60								5.6	5.6										11.2
80.70											2.4								2.4
83.80										7.6									7.6
87.35								2.2	1.1	1.1	1.1								5.5
87.40									1.2										1.2
87.50											1.0	1.0	3.1	1.0					6.1
90.37								1.2											1.2
90.45									3.5	3.5	3.5	2.3	3.5	2.3	1.2				19.8
90.53								1.0								1.0			2.0
90.60							2.1	2.1			2.1								6.3
93.30						1.8	3.7												5.5
93.50										1.7									1.7
100.40									2.0	1.0									3.0
100.50					12.5	3.9	2.0		1.0	1.0				1.0					21.4
100.90											1.0								1.0
105.35	9.2	10.1	6.5	3.6	4.6	6.4	0.9		2.7	1.8	0.9	0.9	0.9						48.5
115.40	4.0		1.0				1.0											1.0	7.0
120.45		0.9	0.9	0.9	1.8		0.9												5.4
120.50	2.2			2.2				1.1											5.5
130.35		0.6	1.2	1.2															3.0
130.40			1.0		1.0														2.0
130.60				1.5															1.5
Total	15.4	11.6	10.6	9.4	19.9	12.1	10.6	13.2	17.1	17.7	12.0	4.2	7.5	4.3	1.2	1.0		1.0	168.8

Table IV (cont'd)
Record of Anchovy Larvae, 1950

Station	Midpoint of Size Class (in mm.)																
	3.0	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.75	Dis.	Total
Cruise 12:																			
87.35			0.8																0.8
105.35					0.8	0.8	0.8												2.4
110.35	0.9							1.1											0.9
110.40																			1.1
113.35	0.8				0.8														1.6
117.35																		6.3	6.3
120.35	1.8	2.7	4.5	15.5	19.1	7.3	6.4	0.9											58.2
120.45				2.4	0.8														3.2
120.50				3.6	1.2														4.8
123.40			1.0	1.0		1.0	1.0												4.0
Total	3.5	2.7	6.3	22.5	22.7	9.1	8.2	2.0										6.3	83.3
Cruise 13:																			
83.55						1.8													1.8
87.35	97.5	3.0	1.5	1.5	1.5		1.5												106.5
93.40							3.1												3.1
97.32	20.0								2.9										22.9
100.30	77.7	7.4	3.7	18.5	3.7			3.7	7.4										122.1
105.35		1.0	1.0	1.0		4.8	1.0												8.8
110.35	2.7	2.7																	5.4
113.35					1.2														1.2
117.35					1.1			1.1											2.2
120.35	111.5																		111.5
120.45		4.3	8.6			2.1			2.1										17.1
120.50		1.0	10.1	10.1		1.0	1.0												23.2
123.40			2.3																2.3
127.40			1.0																1.0
127.50				2.4	2.4		1.2	2.4											8.4
127.60					1.1														1.1
130.35	189.3			2.1	2.1														193.5
130.50		2.0					1.0												3.0
Total	498.7	21.4	28.2	35.6	13.1	9.7	8.8	7.2	12.4										635.1

Table IV (cont'd)
Record of Anchovy Larvae, 1950

Station	Midpoint of Size Class (in mm.)																	
	3.0	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.75	Dis.	Total
Cruise 14:																			
87.35		3.2																	3.2
87.50		1.4		4.2	2.8									1.4					9.8
90.30	8.5		1.0	1.9															11.4
90.37					3.6														3.6
90.53						17.2		17.1	5.7	5.7									45.7
90.60									2.1										2.1
93.30				3.7	1.2														4.9
93.40	7.8	7.8	18.2	15.6	15.6	7.8	10.4	2.6										2.6	88.4
93.50	669.8																		669.8
97.32	166.3	46.2	12.3	12.4	6.2	6.2	6.2	6.2	3.1	3.1				3.1					271.3
97.40	9.6	12.8	25.6	20.8	20.8	12.8	16.0	3.2											121.6
97.50	7.5																		7.5
100.30		1.9		1.9							1.9								5.7
100.50		4.0	6.7	4.0	1.3					1.3									17.3
100.60							5.7	1.1	1.1		2.3	1.1							11.3
113.35		2.4	3.7	4.9															11.0
117.35				1.8		5.5	2.7	5.5		2.7		1.8							20.0
120.45				1.2															1.2
120.60							1.0				1.0								2.0
123.40			1.6	6.4	30.5	22.5	6.4	1.6	3.2										72.2
127.50										1.3	1.3								2.6
130.40									1.1	2.2									3.3
Total	869.5	79.7	69.1	78.8	82.0	72.0	48.4	37.3	16.3	16.3	6.5	2.9		4.5				2.6	1385.9

Table IV (cont'd)
Record of Anchovy Larvae, 1950

Station	Midpoint of Size Class (in mm.)																	
	3.0	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.75	Dis.	Total
Cruise 15:																			
83.55											9.7								9.7
87.35		1.7		5.1	8.5	18.7	34.0	40.8	17.0	11.9		1.7						1.7	141.1
87.40		3.2	4.8	14.6	29.2	29.2	37.3	24.3	14.6	4.8									162.0
87.60			1.9	9.4	3.8	3.8	1.9												20.8
90.37	103.3																		103.3
90.45										1.8									1.8
90.53	37.8	47.3	17.0	7.6	7.6	9.5						1.9							128.7
90.60	8.1	4.1			8.2	4.1			4.1									4.1	32.7
93.30			10.2	6.8	5.1	6.8	1.7	1.7	1.7										34.0
93.40	89.1	16.5	4.2	2.1			2.1												114.0
93.50	1.8	5.3	7.1	5.3	5.3	5.3													30.1
93.60	226.0	118.4	123.7	75.3	21.5	21.5	5.4	10.8	10.8	5.4									618.8
93.70		2.1	2.1	17.1	10.6	34.1													66.0
97.50			4.2			2.1	2.1												8.4
97.60	2.0	4.1		4.1				2.0											12.2
97.70	3.8	20.7	28.2	16.9	1.9			1.9											73.4
100.30			0.8	1.6	2.3	3.0	3.8	1.6	3.1	1.5	0.8	0.8	2.3	1.6					23.2
120.50					1.0	2.0	2.0	2.0											7.0
123.40								0.8											0.8
127.40			1.0			1.0													2.0
Total	471.9	223.4	205.2	165.9	105.0	141.1	90.3	85.9	51.3	25.4	10.5	4.4	2.3	1.6				5.8	1590.0

Table IV (cont'd)
Record of Anchovy Larvae, 1950

Station	Midpoint of Size Class (in mm.)																	
	3.0	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.75	Dis.	Total
Cruise 16:																			
50.100			1.1	1.1															2.2
61.55								2.0											2.0
60.70	6.6																		6.6
60.90									2.2										2.2
63.67				1.7															1.7
70.55					5.0	12.6	5.0												22.6
70.60			5.3	2.6						2.6									10.5
70.90		5.3	5.3			5.3		5.3											21.2
70.100	2.6		7.7																10.3
73.61					3.8	3.8		3.8											11.4
77.55				11.2															11.2
80.100		1.9																	1.9
80.110						1.9	5.8	3.8											11.5
83.55							3.1												3.1
83.60										3.7									3.7
87.35	146.0	78.0	14.0	2.0	2.0				2.0					2.0	2.0				248.0
87.40					2.0	6.0	16.0	10.0	12.0	6.0	4.0	2.0		2.0					60.0
90.30	19.0	1.6			1.6														22.2
90.37	67.0	77.2	14.3	4.0															162.5
90.45															2.1				2.1
90.60					3.0														3.0
93.30	8.4	8.4	5.0																21.8
93.50									1.0			1.0	1.0						3.0
93.60														1.0					1.0
93.70														1.0					1.0
97.32	86.9	101.0	74.7	56.6	32.4	22.3	8.0	2.0	4.0	2.0	2.0			2.0					393.9
100.60		1.0																	1.0
105.35	2.1	3.6		1.4		1.4		0.7											9.2
123.50							1.8	1.8			1.8								5.4
123.60																		0.9	0.9
127.40			1.8																1.8
Total	338.6	278.0	129.2	80.6	49.8	53.3	39.7	29.4	21.2	14.3	7.8	3.0	1.0	8.0	4.1			0.9	1058.9

Table IV (cont'd)
Record of Anchovy Larvae, 1950

Station	Midpoint of Size Class (in mm.)																	
	3.0	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.75	Dis.	Total
Cruise 17:																			
20.10											1.6								1.6
20.40												1.5		1.5					3.0
30.70																1.4			1.4
53.54						1.3	1.3	1.3										1.4	1.4
57.54			2.2	1.1	5.6	2.3													3.9
61.55	3.0	3.0		9.1	9.0	9.0	3.0	3.0											11.2
60.60			3.9	19.5	7.8	11.7		7.8	3.9	15.6	3.9	7.8	7.8	3.9				3.0	42.1
60.70		3.6	58.2	94.6	116.5	61.9	10.9											3.9	97.5
60.80						3.5													345.7
60.100	636.6	374.5	297.5	392.7	293.2	55.7	5.3	2.2	1.1	1.1									3.5
67.55																	1.1		2061.0
70.55												2.0	2.0	2.0	5.9				11.9
73.51																		3.1*	3.1
86.50									1.2										1.2
90.30	5.4	1.8	10.8	7.2	1.8	1.8	1.8		1.8							1.8			34.2
90.37	5.8	7.8																	13.6
90.70														3.8					3.8
Total	650.8	390.7	372.6	524.2	433.9	147.2	22.3	14.3	8.0	16.7	5.5	11.3	9.8	11.2	5.9	3.2	1.1	8.3	2640.1
																	3.1		
Cruise 18:																			
70.60												6.3		6.3					12.6
70.70			3.4		1.7		1.7				1.7								8.5
90.30			1.1																1.1
90.37	2.2	2.2																	4.4
100.30	1.6	0.8			0.8		0.8	0.8	1.6										6.4
120.27		0.9			4.4	6.1	1.8	0.9	0.9										15.0
120.35	5.7			1.9			3.8												11.4
Total	9.5	3.9	4.5	1.9	6.9	6.1	8.1	1.7	2.5		1.7	6.3		6.3					59.4

* Represents one 30.0 mm. larva

INT.-DUP. SEC., WASH., D.C. 28055

Table V

Record of the Larvae of Jack Mackerel (Trachurus symmetricus), 1950

Station	Cruise and Month 11 Feb.	12 March	13 April	14 May	15 June	16 July	17 Aug.	18 Sept.	Sta. Total	Sta. Ave.
40.45	-				-					
40.50	-				-					
40.60	-				-			7	7	1.2
40.70	-									
40.80	-									
40.90	-									
40.100	-							4	4	.6
40.110	-									
43.50	-				-					
43.60	-				-					
47.55	-			-	-					
47.60	-				-					
50.55										
50.60						4			4	.5
50.70										
50.80					3				3	.4
50.90										
50.100						1			1	.1
50.110										
50.120										
50.130										
53.54	-	-	-	-						
53.64	-	-	-	-			-			
55.60					-	-	-	-		
57.54	-	-	-	-						
57.64	-	-	-	-			-			
61.55						2			2	.2
60.60										
60.70							8		8	1.0
60.80						2			2	.2
60.90					4	20			24	3.0
60.100					26				26	3.2
60.110					38	3			41	5.1
60.120					8				8	1.0
60.130					145				145	18.1
63.57	-	-	-	-			2	-	2	.7
63.67	-	-	-	-			-	-		
65.60					-	-	-	-		
67.55	-	-	-	-				-		
67.65	-	-	-	-			-	-		
70.55						23	14		37	4.6
70.60					2	5			7	.9
70.70					22	19	2		43	5.4
70.80						11			11	1.4
70.90		2				48			50	6.2
70.100		2		9	9	18			38	4.8
70.110	-	-	1		14				15	2.1
70.120	-			1	67				68	9.7

Table V (Cont'd)

Record of the Larvae of Jack Mackerel (Trachurus symmetricus), 1950

Station	Cruise and Month 11 Feb.	12 March	13 April	14 May	15 June	16 July	17 Aug.	18 Sept.	Sta. Total	Sta. Ave.
70.130	-		2	76	98				176	25.1
73.51	-	-	-	-		94		-	94	31.3
73.61	-	-	-	-		4	-	-	4	2.0
77.55	-	-	-	-		11	2	-	13	4.3
77.65	-	-	-	-	12	29	-	-	41	20.5
80.55				5				-	5	.7
80.60					62	247		-	309	44.1
80.70				159	125	98	9	-	391	55.8
80.80				416	42	6		-	464	66.3
80.90				514	35			-	549	78.4
80.100			41	105	42		2	-	190	27.1
80.110				14		14		-	28	4.0
80.120			58	195	9			-	262	37.4
80.130			7	17	6	4		-	34	4.9
83.55		-			5		-	-	5	1.0
83.60		-		7	3			-	10	1.7
83.70		-	45	169	71	24	3	-	312	52.0
83.80			214	927	13	4	-	-	1158	193.0
83.90			125	16	10		-	-	151	25.2
87.35						2	-	-	2	.3
87.40	2						-	-	2	.3
87.50			-		-	-	-	-		
87.60			9	45			3	-	57	8.1
87.70		-	316	396	6	10	1	-	729	121.5
87.80		-	189	109	58	27	-	-	383	76.6
87.90		-	519	186			-	-	705	141.0
90.30										
90.37						12	10		22	2.8
90.45										
90.53			7	17					24	3.0
90.60		-	98	2	69	694			863	123.3
90.70		-	78	299	152				529	75.6
90.80		-	107	235	4		3	1	350	50.0
90.90		73	186	100	15				374	46.8
90.100		5	61	17					83	10.4
90.110			102	13	21	26			162	20.2
90.120			23	2		10			35	4.4
93.30							-	-		
93.40				18	12		-	-	30	5.0
93.50			85	6	7	18	-	-	116	19.3
93.60	-	52	5	265	204	1	-	-	527	105.4
93.70		-	-	325	172	4	-	-	501	125.2
93.80	6	-	-	525	94	1	-	-	626	156.5
93.90		-	-	513	92	4	-	-	609	152.2
97.32		-			-	2	-	-	2	.5
97.40		-	234	154	29	2	-	-	419	83.8
97.50		-	243	186	46	4	-	-	479	95.8
97.60		-	-	120	43	35	-	-	198	49.5

Table V (Cont'd)

Record of the Larvae of Jack Mackerel (Trachurus symmetricus), 1950

Station	Cruise and Month 11 Feb.	12 March	13 April	14 May	15 June	16 July	17 Aug.	18 Sept.	Sta. Total	Sta. Ave.
97.70		-	582	164	209	41	-	-	996	199.2
97.80	16	-	133	421	2	2	-	-	574	114.8
97.90		-	12	315	33		-	-	360	72.0
100.30							-			
100.40				5	-	3	-		8	1.3
100.50			4	24	-	3	-	1	32	5.3
100.60		35	136	76	-	34	-		281	46.8
100.70		17	498	502	-	958	-		1975	329.2
100.80		89	342	11	-	32	-	1	475	79.2
100.90		376	9	88	-	1	-	-	474	79.0
100.100		152	99	360	-	1	-	-	612	102.0
100.110		4		133	-		-		137	22.8
100.120				1	-		-	-	1	.2
105.35							-			
110.35		3					-	1	4	.6
110.40		3	18	11	-		-	1	33	5.5
110.50			6	3	-	2	-		11	1.8
110.60			5	69	-		-		74	12.3
110.70			26	14	-		-		40	6.7
110.80			426	54	-	2	-		482	80.3
110.90		1	53	17	-		-		71	11.8
110.100		1	2	6	-		-		9	1.5
110.110			4	1	-		-		5	.8
113.35	-			1	4		-	-	5	.8
117.35	-			1			-	-	1	.2
120.35			4				-		4	.6
120.45							-			
120.50			1	2	2		-		5	.7
120.60			6	4			-		10	1.4
120.70		1	3	8	-	1	-		13	2.2
120.80		60	62	23	-		-		145	24.2
120.90		295		10	-		-		305	50.8
120.100				6	-		-		6	1.0
120.110				2	-		-		2	.3
123.40							-			
123.50		1		9		16	-		26	3.7
123.60			30	59	8		-		97	13.9
127.40			36	12	4		-		52	7.4
127.50				5	1		-	-	6	1.0
127.60				3			-		3	.4
130.35			17				-		17	2.4
130.40			31	3			-		34	4.9
130.50				6		1	-		7	1.0
130.60					-		-			
130.70	1			3	-		-		4	.7
130.80		1		2	-		-		3	.5
Totals	25	1173	5300	8597	2158	2640	59	16	19,968	

Table VI

Record of the Larvae of Hake (Merluccius productus), 1950

Station	Cruise and Month 11 Feb.	12 March	13 April	14 May	15 June	16 July	17 Aug.	18 Sept.	Sta. Total	Sta. Ave.
50.55	2								2	.2
50.60										
50.70										
50.80										
50.90										
50.100										
50.110										
50.120										
50.130										
53.54	-	-	-	-						
53.64	-	-	-	-			-			
55.60					-	-	-	-		
57.54	-	-	-	-						
57.64	-	-	-	-			-			
61.55										
60.60		3							3	.4
60.70		20	35						55	6.9
60.80		303							303	37.9
60.90										
60.100										
60.110										
60.120	3								3	.4
60.130		1							1	.1
63.57	-	-	-	-				-		
63.67	-	-	-	-			-	-		
65.60			3		-	-	-	-	3	.8
67.55	-	-	-	-				-		
67.65	-	-	-	-			-	-		
70.55		1	2			2			5	.6
70.60		2							2	.2
70.70			2	3					5	.6
70.80	16	24							40	5.0
70.90	10	2							12	1.5
70.100	511	76							587	73.4
70.110	-	88							88	12.6
70.120	-	173							173	24.7
70.130	-	38							38	5.4
73.51	-	-	-	-				-		
73.61	-	-	-	-	2		-	-	2	1.0
75.60	1	-	-	-	-	-	-	-	1	1.0
77.55	-	-	-	-				-		
77.65	-	-	-	-			-	-		
80.55					11			-	11	1.4
80.60					5			-	5	.7

Table VI (Cont'd)
Record of the Larvae of Hake (Merluccius productus), 1950

Station	Cruise and Month: 11 Feb.	12 March	13 April	14 May	15 June	16 July	17 Aug.	18 Sept.	Sta. Total	Sta. Ave.
80.70					3			-	3	.4
80.80			16	4	4			-	24	3.4
80.90								-		
80.100		7	3					-	10	1.4
80.110			3					-	3	.4
80.120			2					-	2	.3
80.130								-		
83.55		-	2	8			-	-	10	2.0
83.60		-		7				-	7	1.2
83.70		-	3		4			-	7	1.2
83.80				20			-	-	20	3.3
83.90			9				-	-	9	1.5
87.35		1	2	6		2	-	-	11	1.8
87.40							-	-		
87.50			-		-	-	-	-		
87.60				19				-	19	2.7
87.70	8	-		3				-	11	1.8
87.80	7	-					-	-	7	1.4
87.90		-					-	-		
90.30			3	1					4	.5
90.37										
90.45				22					22	2.8
90.53		2	48	23	6				79	10.0
90.60		-	49	125					174	24.9
90.70		-	221	2					223	31.9
90.80		-	12	1					13	1.9
90.90										
90.100										
90.110										
90.120										
93.30			4	1			-	-	5	.8
93.40			201	26	2		-	-	229	38.2
93.50			13	1			-	-	14	2.3
93.60	-	21	373	40			-	-	434	86.8
93.70		-	-	14	2		-	-	16	4.0
93.80	2	-	-	16			-	-	18	4.5
93.90		-	-				-	-		
97.32		-	3		-		-	-	3	.8
97.40		-	18	6			-	-	24	4.8
97.50	3	-	237	2			-	-	242	48.4
97.60		-	-				-	-		
97.70		-	62	2			-	-	64	12.8
97.80		-	1196	15			-	-	1211	242.2
97.90		-	857	42			-	-	899	179.8
100.30	1		4		4	1	-		10	1.4

Table VI (Cont'd)
Record of the Larvae of Hake (Merluccius productus), 1950

Station	Cruise and Month 11 Feb.	12 March	13 April	14 May	15 June	16 July	17 Aug.	18 Sept.	Sta. Total	Sta. Ave.
100.40					-		-			
100.50	24			3	-		-		27	4.5
100.60		4	49	5	-		-		58	9.7
100.70		40		11	-		-		51	8.5
100.80		7	6		-		-		13	2.2
100.90		28		1	-		-		29	4.8
100.100				19	-		-		19	3.2
100.110					-		-			
100.120					-		-	-		
105.35	3		3				-		6	.9
110.35	47	3	3	1			-		54	7.7
110.40	5	68	742	3	-		-		818	136.3
110.50	9	4	23		-		-		36	6.0
110.60	1	1	26		-		-		28	4.7
110.70		3			-		-		3	.5
110.80			381		-		-		381	63.5
110.90			2		-		-		2	.3
110.100					-		-			
110.110					-		-			
113.35	-	8	1				-		9	1.5
115.40	15	-	-	-	-	-	-	-	15	15.0
117.35	-	18	4	5			-		27	4.5
120.35		141	52				-		193	27.6
120.45		14	28	5			-		47	6.7
120.50		5					-		5	.7
120.60							-			
120.70					-		-			
120.80					-		-			
120.90					-		-			
120.100					-		-			
120.110					-		-			
123.40		23		3			-		26	3.7
123.50			2				-		2	.3
123.60							-			
127.40					1		-		1	.1
127.50							-	-		
127.60							-			
130.35	1	2	8	54			-		65	9.3
130.40		1	5				-		6	.9
130.50							-			
130.60					-		-			
130.70		7			-		-		7	1.2
130.80					-		-			
Totals	669	1139	4718	519	44	5			7094	

Table VII

Record of the Larvae of Rockfish (Sebastodes spp.), 1950

Station	Cruise and Month: 11 Feb.	12 March	13 April	14 May	15 June	16 July	17 Aug.	18 Sept.	Sta. Total	Sta. Ave.
20.10	-	-	-	-	-	-	8	-	8	8.0
20.20	-	-	-	-	-	-		-		
20.30	-	-	-	-	-	-	3	-	3	3.0
20.40	-	-	-	-	-	-	4	-	4	4.0
20.50	-	-	-	-	-	-		-		
20.60	-	-	-	-	-	-		-		
20.70	-	-	-	-	-	-		-		
20.80	-	-	-	-	-	-		-		
20.90	-	-	-	-	-	-		-		
23.15	-	-	-	-	-	-	82	-	82	82.0
27.20	-	-	-	-	-	-	1	-	1	1.0
30.26	-	-	-	-	-	-	4		4	2.0
30.30	-	-	-	-	-	-				
30.40	-	-	-	-	-	-	5	3	8	4.0
30.50	-	-	-	-	-	-				
30.60	-	-	-	-	-	-	4	2	6	3.0
30.70	-	-	-	-	-	-				
30.80	-	-	-	-	-	-				
30.90	-	-	-	-	-	-				
30.100	-	-	-	-	-	-				
33.32	-	-	-	-	-	-	41	4	45	22.5
37.38	-	-	-	-	-	-	2	2	4	2.0
40.45	-	178*	5		-	38	19	4	244	40.7
40.50	-	630	9	4	-	2	2	10	657	109.5
40.60	-	37	2	22	-	13	7		81	13.5
40.70	-	29	24	2		16	4		75	10.7
40.80	-	46	13	2	27	9	2		99	14.1
40.90	-	36	28	4	17	4	5		94	13.4
40.100					15	9	4	4	32	4.6
40.110	-					7			7	1.0
40.120	-	-	-	-	-	-				
43.50	-	64	29	1	-	52			146	24.3
43.60	-	28	34	3	-	41	5	7	118	19.7
47.55	-	133	20	-	-	88	10	4	255	51.0
47.60	-	45	18	46	-	14			123	20.5
50.55	34	4	4	17	12	14	11		96	12.0
50.60	4	12	2	49	4	8	13		92	11.5
50.70	2	4	2		28	49		4	89	11.1
50.80	1		6		2	10	8	2	29	3.6
50.90	1	5	12		40		11		69	8.6
50.100			10		14	2	2	5	33	4.1
50.110			1	47	4				52	6.5

* Sample non-quantitative due to net being torn

Table VII (Cont'd)
Record of the Larvae of Rockfish (Sebastodes spp.), 1950

Station	Cruise and Month 11 Feb.	12 March	13 April	14 May	15 June	16 July	17 Aug.	18 Sept.	Sta. Total	Sta. Ave.
50.120				1					1	.1
50.130										
53.54	-	-	-	-	20	54	66	6	146	36.5
53.64	-	-	-	-	22	58	-	2	82	27.3
55.60	4	13			-	-	-	-	17	4.2
57.54	-	-	-	-	13	2	20	11	46	11.5
57.64	-	-	-	-	19	37	-	6	62	20.7
61.55	177	9	64		35	12	9	19	325	40.6
60.60	39	12	4		4	6	36	20	121	15.1
60.70	4	4	4	4	10	10	35	20	91	11.4
60.80	3	2			8	42	7	3	65	8.1
60.90	3	2			4	29		4	42	5.2
60.100	1	2					11		14	1.8
60.110	6								6	.8
60.120		2							2	.2
60.130										
63.57	-	-	-	-	5	47	13	-	65	21.7
63.67	-	-	-	-	4	5	-	-	9	4.5
65.60	85	24	7	3	-	-	-	-	119	29.7
67.55	-	-	-	-	60	8	256	-	324	108.0
67.65	-	-	-	-		11	-	-	11	5.5
70.55	53		2		6	28	20	8	117	14.6
70.60	7	7		4		5	2		25	3.1
70.70	8	7		6		5			26	3.2
70.80	6	15	2	4		4		2	33	4.1
70.90			10		3	37			50	6.2
70.100				1		10			11	1.4
70.110	-				3				3	.4
70.120	-									
70.130	-									
73.51	-	-	-	-	8	94	22	-	124	41.3
73.61	-	-	-	-	5	8	-	-	13	6.5
77.55	-	-	-	-	16	11	12	-	39	13.0
77.65	-	-	-	-	12	4	-	-	16	8.0
80.55	11	7		25	7	4	8	-	62	8.9
80.60	33	28	3	3	2	35	2	-	106	15.1
80.70	14			6		22	4	-	46	6.6
80.80	3	3	22		35		2	-	65	9.3
80.90								-		
80.100								-		
80.110					2			-	2	.3
80.120								-		

Table VII (Cont'd)
Record of the Larvae of Rockfish (Sebastodes spp.), 1950

Station	Cruise and Month 11 Feb.	12 March	13 April	14 May	15 June	16 July	17 Aug.	18 Sept.	Sta. Total	Sta. Ave.
80.130								-		
83.55	84	-	270	16	15	3	-	-	388	77.6
83.60		-	10		18	11	2	-	41	6.8
83.70	70	-	6		8	7		-	91	15.2
83.80	8		2			2	-	-	12	2.0
83.90							-	-		
87.35	318	118	52		14	10	-	-	512	85.3
87.40	318	300	128	6	3	4	-	-	759	126.5
86.50	-	-	-	-	-	4	10	-	14	7.0
87.50	77	186	-	14	-	-	-	-	277	92.3
87.60	8	24		26	162	19		-	239	34.1
87.70	8	-				5	1	-	14	2.3
87.80		-					-	-		
87.90		-					-	-		
90.30	16	7	9	7	5				44	5.5
90.37	30	75	6	11		4	6	3	135	16.9
90.45	238		38	27		4		1	308	38.5
90.53	109	239	126	120	38	8	4		644	80.5
90.60	161	-	8	47	93	9	17		335	47.9
90.70		-	11		2				13	1.9
90.80		-								
90.90										
90.100										
90.110										
90.120										
93.30	11		48	1		7	-	-	67	11.2
93.40		4	283	16	10	3	-	-	316	52.7
93.50	20	3	10	3	4	36	-	-	76	12.7
93.60	-		345	15	43	1	-	-	404	80.8
93.70	6	-	-	13	6		-	-	25	6.2
93.80		-	-	2	6		-	-	8	2.0
93.90		-	-			2	-	-	2	.5
97.32	6	-	126	40	-		-	-	172	43.0
97.40	2	-	11	6	7		-	-	26	5.2
97.50	3	-	3	35	6		-	-	47	9.4
97.60	3	-	-		12	4	-	-	19	4.8
97.70	24	-	4	4	24		-	-	56	11.2
97.80		-	52	23	4		-	-	79	15.8
97.90		-	349	12			-	-	361	72.2
100.30	28	38	67	15	4	1	-	12	165	23.6
100.40	5	60	5	2	-		-		72	12.0
100.50	3		2	8	-	1	-		14	2.3

Table VII (Cont'd)
Record of the Larvae of Rockfish (Sebastodes spp.), 1950

Station	Cruise and Month 11 Feb.	12 March	13 April	14 May	15 June	16 July	17 Aug.	18 Sept.	Sta. Total	Sta. Ave.
100.60			2	5	-	7	-		14	2.3
100.70		9		15	-	8	-		32	5.3
100.80		14			-	1	-		15	2.5
100.90					-		-			
100.100				22	-		-		22	3.7
100.110					-		-			
100.120					-		-	-		
105.35	48	1	33	2	2	3	-		89	12.7
110.35	3	4	8		4		-		19	2.7
110.40	2	12	21	3	-	1	-		39	6.5
110.50				2	-		-		2	.3
110.60		1			-		-		1	.2
110.70	1			1	-		-		2	.3
110.80			1		-		-		1	.2
110.90					-		-			
110.100					-		-			
110.110					-		-			
113.35	-	217	158	10	1		-		386	64.3
115.40	3	-	-	-	-	-	-	-	3	3.0
117.35	-	92	46	21	6		-		165	27.5
120.35	4	9	88	2			-		103	14.7
120.45	3	60	41	16	1	2	-		123	17.6
120.50	14	1	5		5	1	-		26	3.7
120.60							-			
120.70				1	-		-		1	.2
120.80					-		-			
120.90					-		-			
120.100					-		-			
120.110					-		-			
123.40		38	18	31	2	1	-	2	92	13.1
123.50			2	6		2	-	3	13	1.9
123.60							-			
127.40							-			
127.50				1			-	-	1	.2
127.60							-			
130.35	5	23	8	40	6		-		82	11.7
130.40		8		11	1		-	1	21	3.0
130.50					1		-		1	.1
130.60				1	-		-		1	.2
130.70					-		-			
130.80					-		-			
Totals	2138	2931	2739	913	979	1135	822	174	11831	